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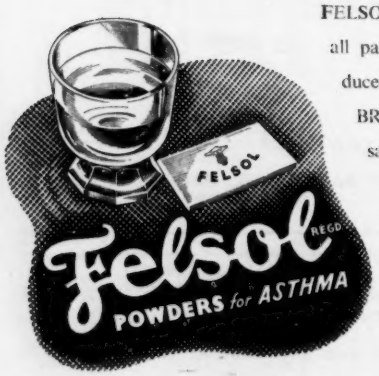

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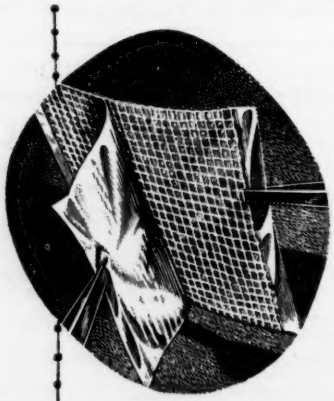

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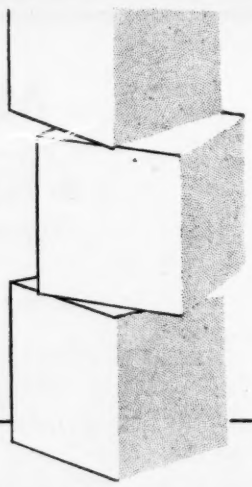

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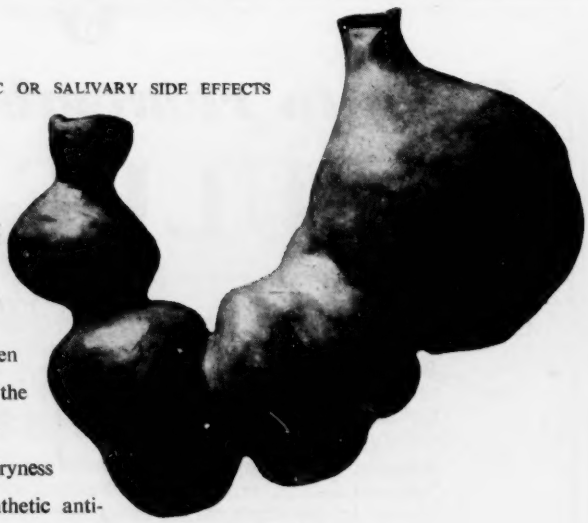

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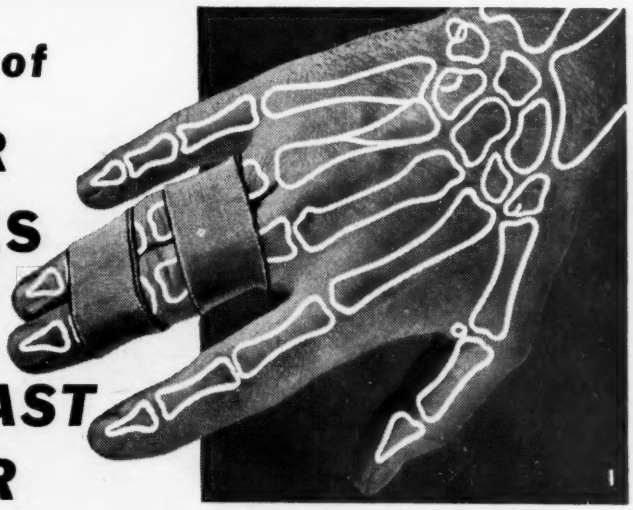

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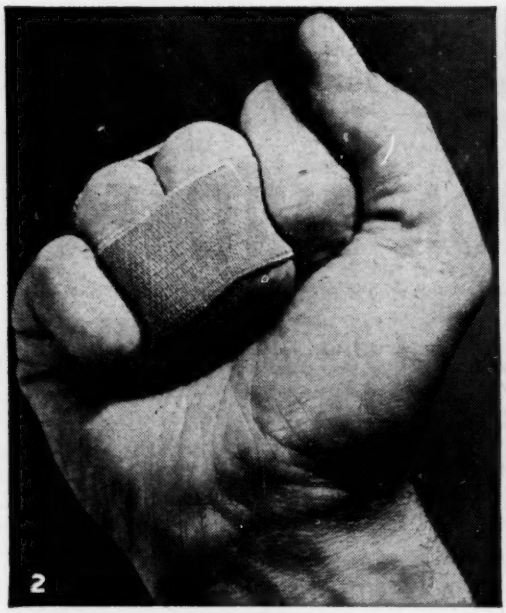

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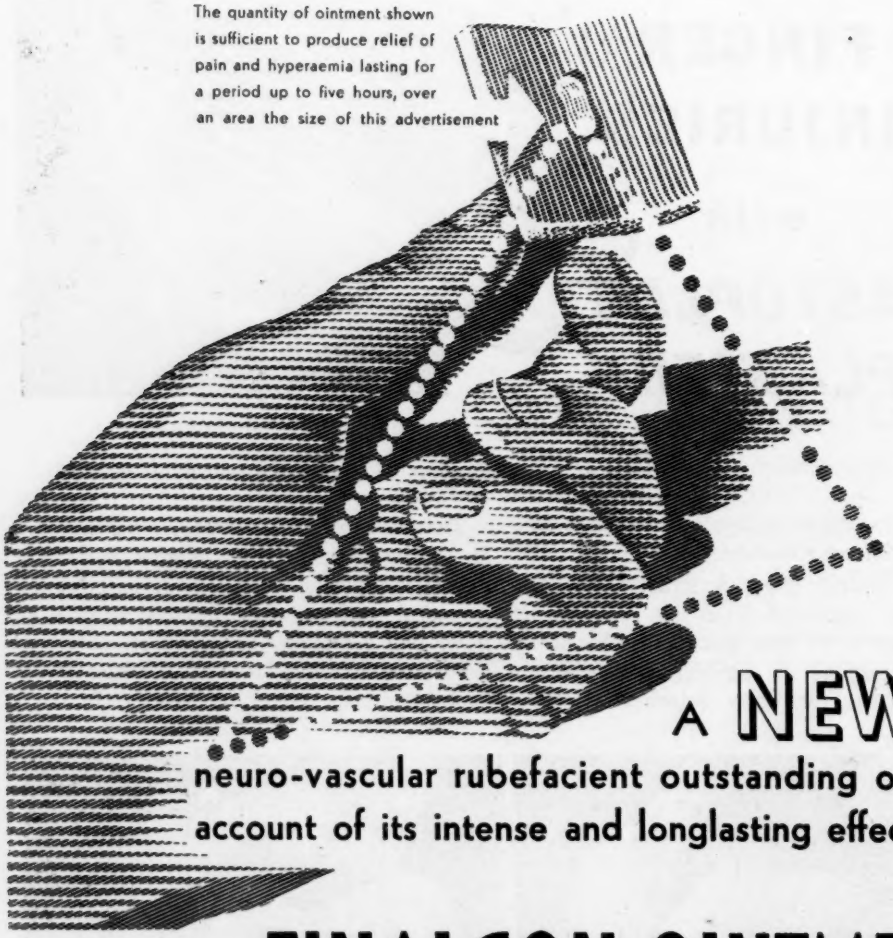

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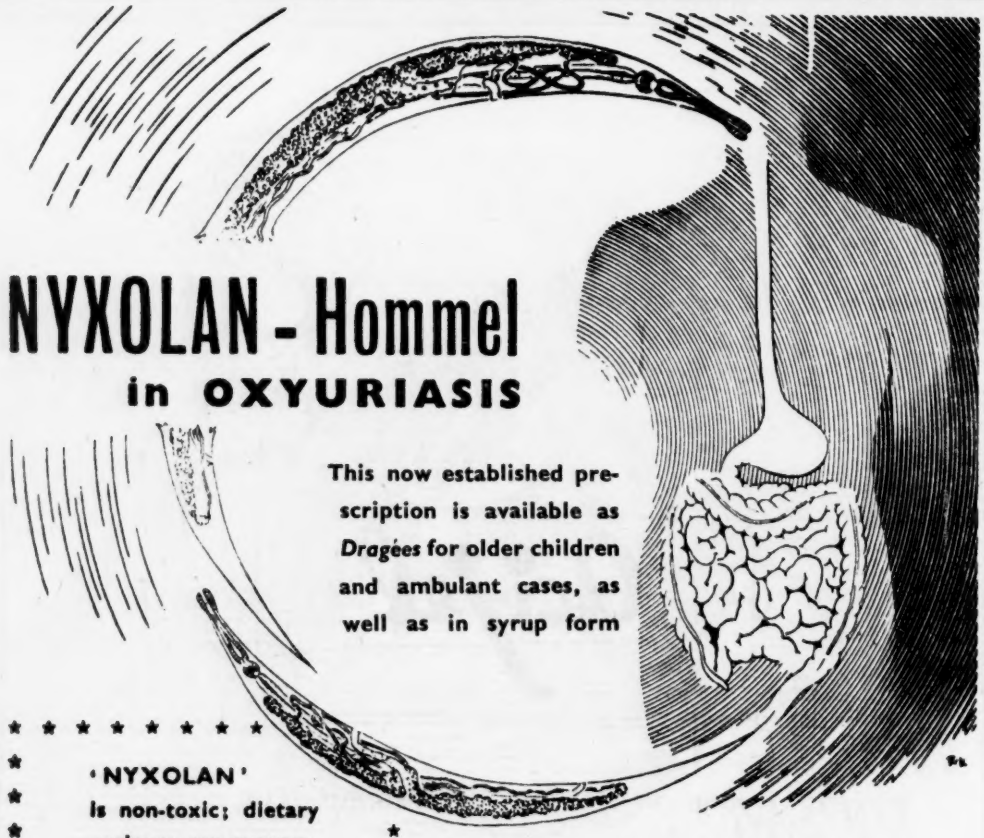

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Aneurine hydrochloride (B_1).....3 mg.
Riboflavine (B_2) .....6 mg.
Nicotinamide .....30 mg.
pantothenic acid, pyridoxine, and folic acid, choline, inositol, biotin, para-aminobenzoic acid and other naturally occurring factors of the vitamin B complex.

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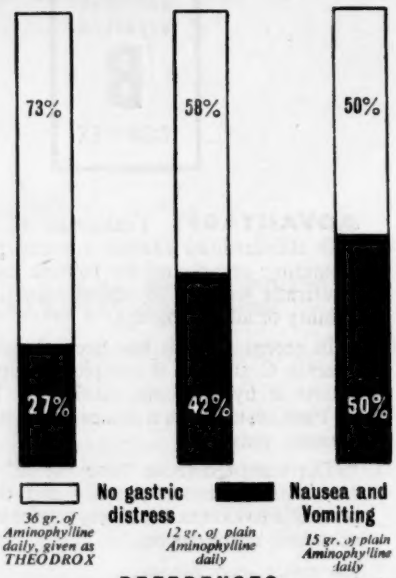

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REFERENCES

(1) Studies with Two New Theophylline Preparations, *Amer. J.med. Sci.*, 224 : 627, 1952.

(2) A New Approach to Increasing Tolerance to Oral Aminophylline, *Postgrad. Med* 13 : 432. May, 1953. Abstracted; *Practitioner* 171: 328 (Sept. 1953)

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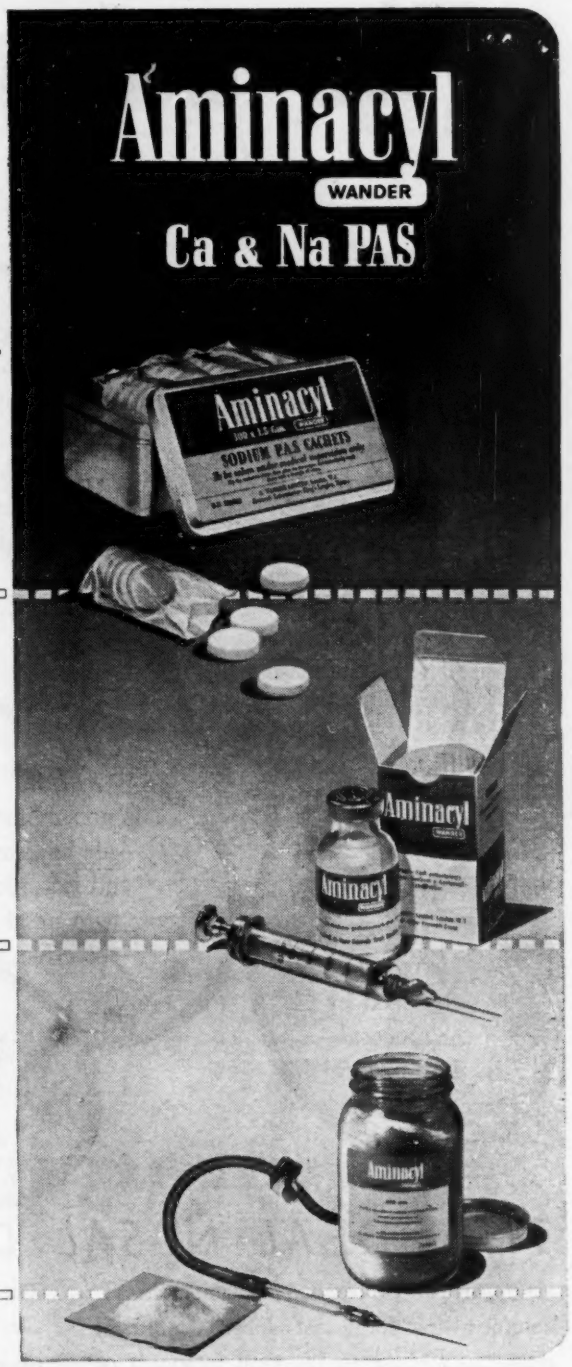

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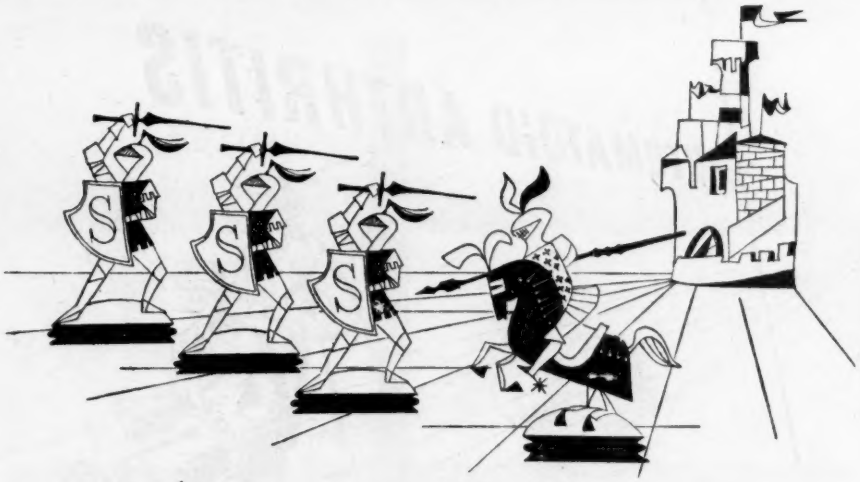

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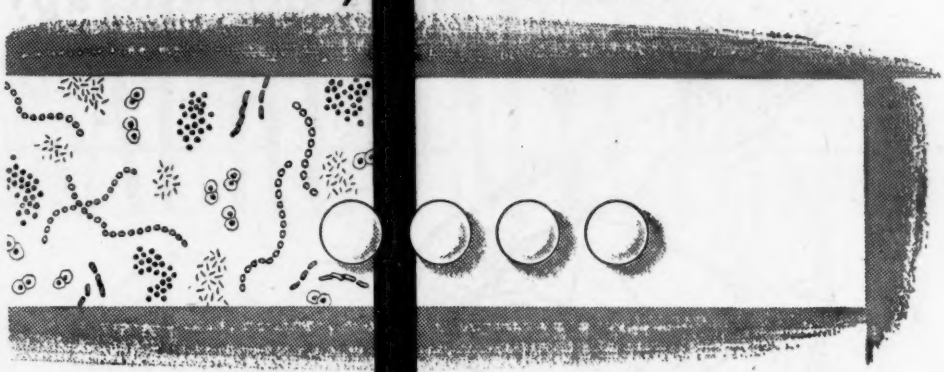

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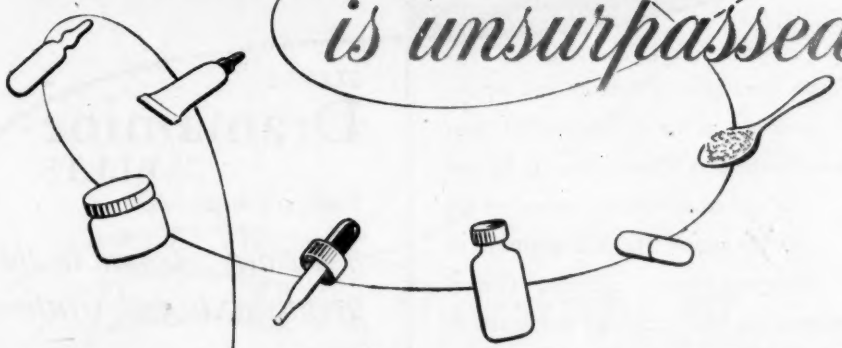

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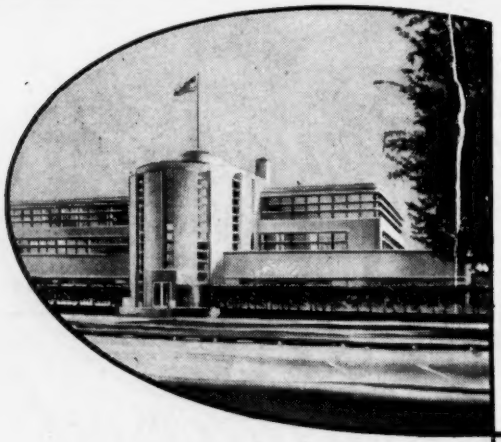

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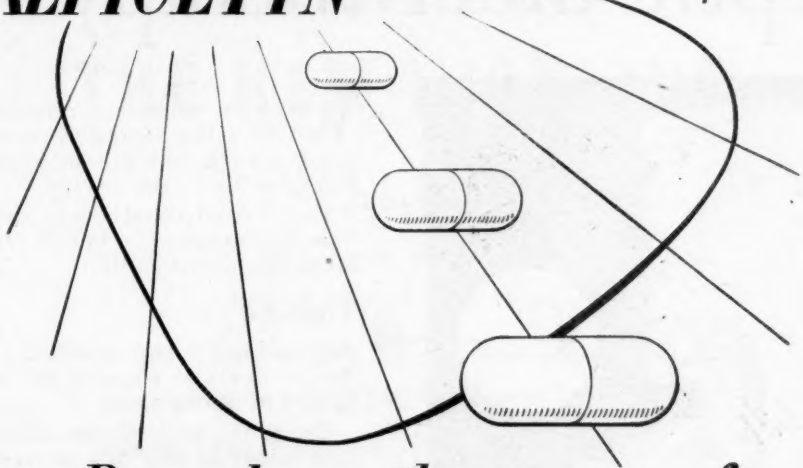

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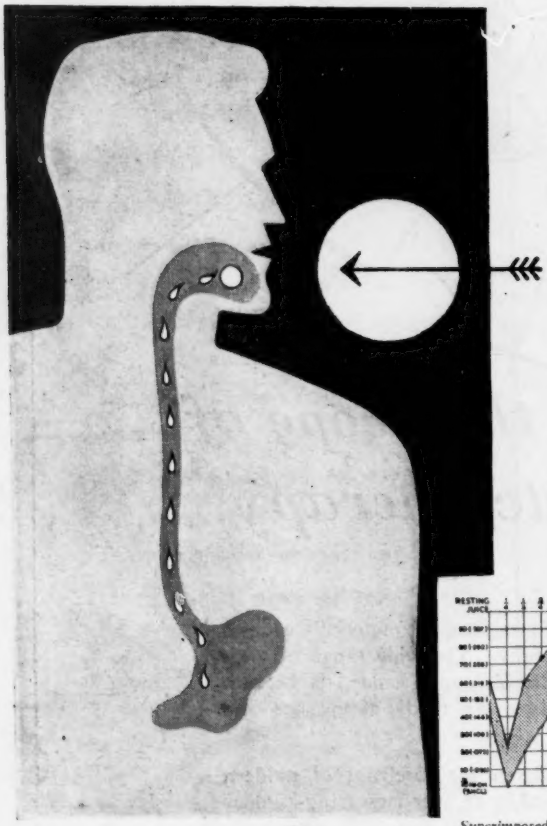

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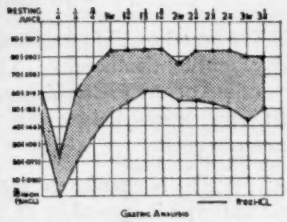
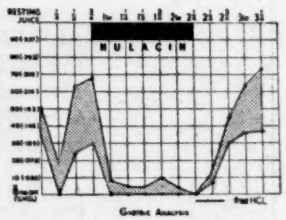
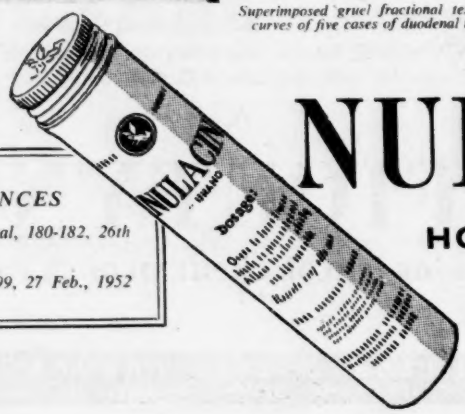


Superimposed gruel fractional test-meal curves of five cases of duodenal ulcer



Same patients as in Fig. 1, two days later, showing the striking neutralizing effect of sucking Nulacin tablets (3 an hour). Note the return of acidity when Nulacin is discontinued.



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REFERENCES

British Medical Journal, 180-182, 26th July, 1952.

Medical Press, 195-199, 27 Feb., 1952

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MEP/E/4

VESICOVAGINAL FISTULÆ

REVIEW OF 100 CONSECUTIVE CASES

J. CHASSAR MOIR
M.A., M.D. Edin., F.R.C.S.E., F.R.C.O.G.
NUFFIELD PROFESSOR OF OBSTETRICS AND GYNÆCOLOGY IN THE UNIVERSITY OF OXFORD

IN this country the vesicovaginal fistula is rare, but it was not always so; once it was a dreaded complication of childbirth, described by Sir J. Y. Simpson as "the most depressing and deplorable of all infirmities of which woman is liable, a condition looked upon as beyond all relief and hope." Although fistulæ caused by obstetrical misadventure are now rare, fistulæ caused by surgical injury increase as pelvic surgery develops and operations become more extensive and complicated.

Today, in those parts of the world where contracted pelves are common, or maternity services poorly developed, and especially in Negresses, the vesicovaginal fistula is a serious surgical problem. Several workers have reported the treatment of a long series of cases. For example, Mahfouz (1938), of Cairo, has recorded his experiences with 400 cases of urinary fistulæ, many of them most complicated, and has since operated on a further considerable series. His cure-rate is about 95%.

Because vesicovaginal fistulæ are rare, few surgeons in this country have opportunity of gaining experience in this class of work. I have been fortunate in having had many such cases referred to me, and now report 100 consecutive cases. This series is noteworthy for the fact that, in most instances, the fistula presented unusual features or had resisted previous attempts at closure and been assumed to be "intractable." Indeed, in many of the cases the patient had been urged to have the ureters transplanted into the colon and been assured that only thus could she escape from a life of continual wetness.

Ætiology

Of the 100 cases the cause was obstetrical in 36 and gynæcological in 64. In the gynæcological group (table I)

TABLE I—GYNÆCOLOGICAL CAUSES OF FISTULA IN 64 CASES

Hysterectomy:		Aldridge sling	1
Abdominal or vaginal ..	23	Ulceration of obscure origin	2
Wertheim	5	Amputation of cervix ..	1
Colporrhaphy (including "Manchester" operation)	18	Myomectomy	1
Radium	5	Vaginal fixation	1
Congenital abnormality ..	2	Cotton-reel in vagina ..	1
Millin sling	3	Abdominoperineal resection for carcinoma of rectum	1

the injury resulted most commonly from pelvic surgery—usually extensive or difficult gynæcological operations (fig. 1). It is significant, however, that in 18 it followed "simple" colporrhaphies. Some of these 18 may have been caused by bladder injury or at the time of operation; others were probably the result of a hæmatoma followed by sepsis and necrosis of the bladder wall; a few may have arisen, I suspect, from trauma inflicted on the upper urethra by unskilful catheterisation after the colporrhaphy.

With 1 exception all the cases seen have been included in this report; but cases of fistula caused by active carcinoma have not been included.

The 1 exception was the case of a woman recently arrived from Eire who presented a deplorable condition. She stated that at her confinement, about a year before, she had been left unattended for twenty-four hours with an aftercoming fœtal head retained in the pelvis. The whole anterior vaginal wall had sloughed, and the periosteum of the posterior aspect of the pubes was widely exposed. There was a double infected hydronephrosis; and urine, milky with pus, could be seen discharging into the vagina on both sides.

After treatment for the urinary sepsis this patient greatly improved in general health and was temporarily discharged from the hospital. Unfortunately she then returned to her country without trace. Her injuries were so extensive that transplantation of the ureters into the colon would probably have been required.

Duration

The duration of the fistula is shown in table II. It will be seen that in many cases the fistula was of very long standing—in one case as long as thirty-two years.

Some of these women gave pathetic histories. On the data supplied, one woman was reckoned to have washed no less than 175,000 Turkish towels in twenty-two years. Another had spent £400 on absorbent wool in sixteen years. Another had used 6000 bales of wool and washed 60,000 towels in twenty-two years.

TABLE II—DURATION OF FISTULA

Years	No. of cases	Years	No. of cases
Up to 7	86	Up to 21	1
" " 8	3	" " 22	3
" " 9	1	" " 24	1
" " 10	1	" " 28	1
" " 12	1	" " 32	1
" " 16	1		

Rather surprisingly the bladder has, even in cases of long standing, resumed normal function at once, or within a very short time of the closure of the fistula.

In 2 recent cases this has not been so. In one there had been extensive destruction of the bladder and rectum by previous applications of radium. In the other the urethra had been entirely destroyed and the bladder grossly injured as the result of many previous attempts at surgical repair by the transvesical route. There was also gross dilatation of one ureter, which was found when, on simple catheterisation of the bladder, the rubber catheter passed straight into the ureter. These 2 patients are still under observation, and an improvement in bladder capacity may possibly still take place.

Only in two or three cases out of the total series of 100 has there been any serious trouble with cystitis. It seems that the bladder quickly accustoms itself to the organisms usually present, and that serious infection of the urinary tract is rare, provided that the urine can escape freely.

Previous Operations

The number of operations done before the patient came under observation is shown in table III. It was not always easy to get an exact history of the number and nature of previous operations, for the patient sometimes confused examinations under anæsthesia with attempts at surgical repair. However, the information given in table III was carefully obtained and is substantially accurate. The patient who had 19 previous operations was a doctor's wife who was able to give precise information about each of them; all 19 were attempts, direct or indirect, at repair.

The number of operations required to close the fistula after the patient came under the present treatment is shown in table IV. It will be seen that in every case uncomplicated by previous attempts at repair a successful

TABLE III—PREVIOUS OPERATIONS (INCLUDING TRANSVESICAL AND TRANSPERITONEAL OPERATIONS)

No. of operations	No. of cases	No. of operations	No. of cases
None	25	12	1
1	23	17	1
2	7	18	1
3–5	22	19	1
6–8	5	Not stated, or "many"	11
9–11	3		

TABLE IV—OPERATIONS REQUIRED TO CLOSE FISTULA

Operation	Closed at 1st operation	Closed at 2nd operation	Closed at 3rd operation	Closed after simple drainage
Repair of bladder :				
Had no previous operation	25*	—	—	—
Had previous operation(s)	48	10	2†	3
Complete reconstruction of urethra :				
Had no previous operation	1	—	—	—
Had previous operation(s)	8	3	—	—

*Includes case of unsuccessful resuturing attempted for reasons of expediency two weeks after colporrhaphy.
†Includes case of radium necrosis.

closure was effected on the first occasion. Cases in which there was a congenital abnormality (hypospadias), or complete destruction of the urethra, presented particular problems and are therefore listed separately.

Cases of Special Interest

In a series of 100 cases of fistula, most of them referred for a special reason, it is to be expected that many would present features of exceptional interest. Among these may be cited the following.

Extensive Destruction of Bladder Wall

The extent of the destruction of bladder and vaginal walls after the obstetrical injury was sometimes astonishing.

One patient, who had been confined in a war-time emergency maternity hospital, gave a history of a grossly prolonged labour ending in a craniotomy. Severe sepsis ensued, and during the course of a desperate illness lasting several weeks the entire uterus appears to have sloughed, and to have been expelled through the vagina. Although this young woman regained good health, she never menstruated again; and pelvic examination showed that the pelvis was as empty as if a total hysterectomy had been done. There was a huge hole in the region of the trigone of the bladder. The surrounding tissues were so fibrosed as to resemble cartilage, and, as stated in the notes, "cut like linoleum." After two operations this opening was closed, and surprisingly good urinary control was restored.

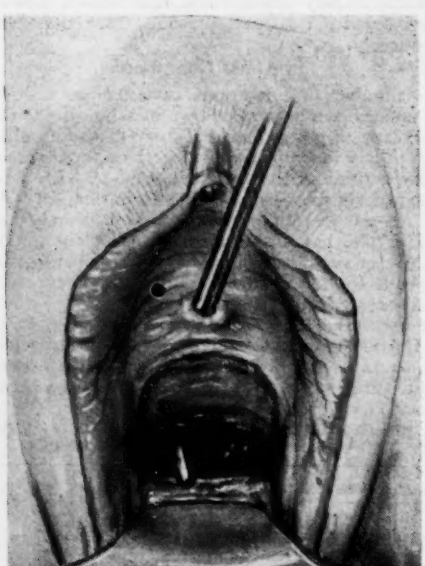

Fig. 1—Very large fistula following Wertheim operation.

Exposure of Ureters

In several cases the ureter, or ureters, could be seen opening at the edge of the fistula or in the vagina. During surgical repair it was usually possible to turn the ureteric orifice inwards to lie in the reconstructed bladder, but in 2 cases a laparotomy was required to reimplant the ureter into the bladder.

There is of course considerable danger that the ureters may be occluded by stitches inserted in their proximity; and it is sometimes helpful to insert a catheter to identify the ureter during this part of the surgical repair. In one case I inadvertently caused a temporary unilateral occlusion by distorting the ureter with the stitching. The obstruction was overcome by making a temporary nephrostomy; and, when the sutures were later removed, the ureteric function was fortunately quickly restored.

High Position of Fistula

In many cases the fistula was at a very high level in the vagina, particularly in injuries following hysterectomy (fig. 3). By use of two or three pairs of Stiles's tissue forceps the fistula could usually be drawn within easy reach, although sometimes—in nulliparæ, for example—a wide episiotomy was also required to gain sufficient access. This fact is specially recorded, for cases of high fistulæ are often wrongly stated to be unsuitable for treatment by vaginal operation.

Fig. 2—Destruction of upper two-thirds of urethra with extension into bladder trigone. A finger could be easily inserted through vesico-vaginal fistula.

Scarring and Fixation

Perhaps the chief cause of difficulty in fistula repair is the presence of dense fibrous tissue—the result, not infrequently, of previous unsuccessful attempts at repair. Matters are made worse if the fibrosis has pulled the fistula from the midline and has anchored it at a high level against the descending ramus of the pubic bone. 2 of the worst cases in this respect were patients whose urethræ had been extensively damaged and distorted in the course of a "Millin 1" sling operation for stress incontinence of urine.

Multiple Fistulæ

On several occasions multiple bladder fistulæ were found. In 3 cases there was a separate and unsuspected *ureterovaginal fistula* in addition to the known vesico-vaginal fistula. The combination with a *rectovaginal fistula* will be mentioned later.

Vesicocervical Fistula

In 3 cases a vesicocervical fistula was present. In each the bladder was separated from the cervix, and the

Fig. 3—Vesicovaginal fistula at very high level, typical of hysterectomy injury.

combined vaginal and bladder walls were sutured to the denuded anterior aspect of the cervix, above the level of the injury.

Bladder Calculus

In 1 case a large vesical calculus was present. This was extracted through a separate vaginal cystotomy made at a high level in the trigone of the bladder at the time of the repair of the existing vesicovaginal fistula. As expected, the artificial fistula thus created closed spontaneously within a few days (Moir 1942, 1947).

Multiple Previous Operations

As previously stated, a high proportion of the women (75%) had previously had one or more unsuccessful operations, including many by the suprapubic route.

A case of special interest was that of the patient who had had no fewer than 19 previous operations. When first seen she was permanently retaining a very large (no. 30 French gauge) mushroom-headed catheter in the urethra; two small fistulæ were still present at the junction of the urethra with the bladder. Treatment was by complete reconstruction of the urethra. At the same operation a portion of fascia lata was obtained and inserted round the neck of the bladder after the fashion of the Aldridge operation (the abdominal wall was too scarred to permit of the usual Aldridge technique). Although this patient still has some stress incontinence, the operation has completely transformed her mode of life.

Radium Damage

Destruction of the vaginal wall after the application of radium is a form of injury particularly difficult to treat.

In several cases there was a rectovaginal, as well as a vesicovaginal, fistula (fig. 4). A preliminary colostomy was done before an attempt was made to close the rectal fistula. If the repair was satisfactory, the colostomy was "undone" after an interval of at least six weeks; after which, attention was turned to the bladder injury.

A high colpocleisis was performed in some of these cases of radium burn. Contrary to what might be supposed, this did not lead to an obvious diverticulum of the bladder, for the small portion of vagina above the colpocleisis contracted and became incorporated in the posterior bladder wall.

A nullipara, aged 63, had complete incontinence of urine and fæces following radium necrosis and surgical injury (hysterectomy). There was extensive destruction of the bladder, leading to a communication with the colon through an opening at least $1^1/_4$ in. in diameter. In addition, there was a vesicovaginal fistula of smaller dimension.

A temporary colostomy was done. Three weeks later the abdomen was opened and, with considerable difficulty, the bladder separated from the colon. Each organ was then closed separately. Since this repair necessitated a midline bisection of the bladder, the opportunity was taken of repairing the small vesicovaginal fistula by the transvesical route.

These considerable operations led to the closure of the colon and the closure of the bladder where it had communicated with the colon. Unfortunately the vesicovaginal fistula reopened; but a later operation, this time by the vaginal route, successfully closed this remaining fistula. At a later date the colostomy was undone, and normal bowel function was restored.

This patient is now transformed in her general health. Her bladder capacity is much reduced, but its function is slowly improving.

In one case of intractable radium burn a displaced muscle was used to restore the blood-supply. This is an operation devised by Dr. Ingelman Sundberg, of Stockholm, to whom I am greatly indebted for advice and for description of the operative technique.

The gracilis muscle was used. After detachment from its insertion it was lifted from its bed and, care being taken to preserve its blood-supply, was displaced through the obturator foramen to lie in the vault of the vagina within the denuded edges of the fistula. This patient is still under observation; her condition is greatly improved, but her bladder capacity is still severely reduced.

Inversion of Bladder

In 4 cases the vesicovaginal fistula was so large that the bladder became inverted through the opening. In 2 cases the inversion was contained within the vagina, where, on examination with a speculum, the bladder mucosa could be seen as a red velvety mass. In 2 others the bladder, turned completely inside out, presented at the vulva and simulated a cystocele; in 1 of these cases the mass was so large that it appeared, at first sight, to be a complete uterine procidentia—for which condition it had been mistaken by the patient's own doctor (fig. 5).

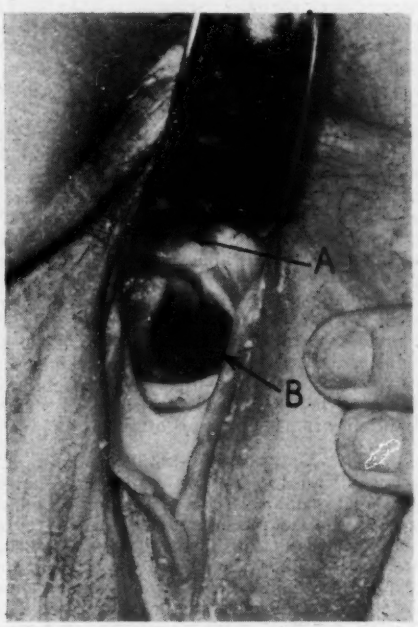

Fig. 4—Necrosis resulting from radium treatment: A, rectovaginal fistula; B, very large vesicovaginal fistula involving most of urethra. Patient is in knee-chest position to make exposure easier.

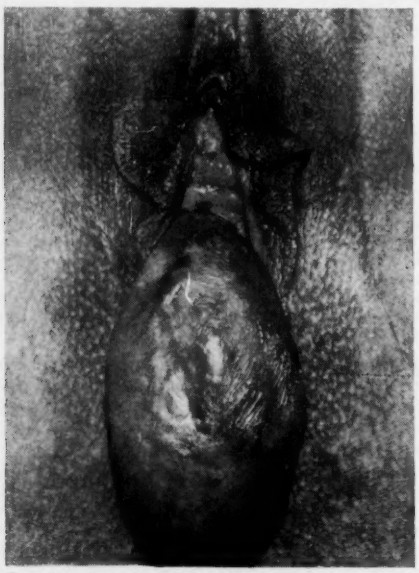

Fig. 5—Complete inversion of bladder through large vesicovaginal fistula of 27 years' duration, simulating uterine procidentia (Moir 1953).

This fistula, which had been present for 27 years, was easily and completely cured by a single operation.

Complete Destruction of Urethra

There were 12 cases of complete destruction of the urethra. Although an anatomically satisfactory channel was reconstructed in each case, the physiological results in this group have not always been as good as desired, because of defective sphincteric control.

Two patients who had a residual stress incontinence obtained substantial relief from the use of a specially shaped pessary designed to press on the lower part of the urethra. In 4 others an Aldridge sling operation considerably improved the urinary control.

Transplantation of Ureters

In 4 cases with complete destruction of the urethra a transplantation of the ureters into the colon was later advised, and in 3 it was done. Of the 4 women 2 had a severe congenital abnormality of the bladder (hypospadias)—a condition for which reconstructive surgery is seldom satisfactory. A further case might have been included—that of the woman with severe bladder contraction following multiple bladder operations—were it not that the gross ureteric abnormality precluded further surgery.

I wish to emphasise that these 3 cases were the only ones in the entire series of 100 in which the transplantation of ureters into colon was required.* These operations, undertaken by a surgical colleague, had excellent results in 2 cases; in the 3rd—that of an extremely obese woman—death took place from peritonitis. This was the only fatality in the 100 cases of fistula.

Operative Technique

I do not intend to describe operative technique in detail. Vesicovaginal fistulæ vary greatly one from another, and no set procedure is applicable to every case. Nevertheless the following points concerning technique in general may be of interest.

All the operations for vesicovaginal and urethrovaginal fistulæ were by the vaginal route. Usually the lithotomy position was used, but occasionally the knee-chest position gave better exposure. If the fistula was high it was drawn within reach with several pairs of Stiles's tissue forceps. Sometimes, especially in nulliparæ, a deep episiotomy was also required; this was successful even in the case of a postmenopausal "virgo intacta" with a "one-finger" vagina.

The essential feature of the operation used is the establishment of broad raw surfaces on the combined (and unseparated) bladder and vaginal walls. From a rather wide elliptical perimeter the incision slopes downwards and inwards to the bladder mucosa but avoids the mucosa. Occasionally a slight undercutting of the vaginal wall is necessary, but no attempt is made to separate the bladder widely from the vagina as has been advised by many workers on this subject.

The main suturing is by a series of interrupted mattress stitches inserted in such a manner as to bring the raw "saucerised" surfaces into broad apposition. These sutures are of either silver wire or monofilament 'Nylon,' no. 5 size. Catgut is carefully avoided because, if it is introduced into the main part of the wound, there is a grave danger of sepsis ensuing and of the whole repair breaking down. In this connection it must be remembered that the sutured edges are poorly vascularised and there is inevitable seepage of infected urine. In these conditions catgut is, I believe, a most unsuitable material; and its extensive use probably accounts for many a well-sutured fistula failing to unite (Moir 1940). Nevertheless a strictly submucosal running stitch of very fine catgut (3/0) can occasionally be used to advantage; this preliminary approximation of the immediate bladder edge facilitates the preparation of the main part of the wound by enabling the removal of scar tissue and any essential undercutting to be done with greater ease and accuracy. This step accomplished, the broad raw edges of the combined bladder and vaginal walls are approximated in the manner already described.

If there is tension after the sutures are tied, a relaxation incision is made on one or both sides of the vagina to divide the tethering bands. This restores laxity to the sutured region and ensures continuation of the blood-supply.

At the completion of the operation great care must be taken to evacuate any blood-clot that may have formed in the bladder. This is done by thorough syringing—repeated injection and aspiration—with a Dakin syringe attached to a wide-bore catheter. The bladder is drained with a whistle-tip rubber catheter with an extra lateral eye. The catheter is attached by a firm stitch to the external urethral meatus.

Drainage is helped by gentle suction from hydrostatic bottles, and is maintained for 14 days. The stitches are removed on the 21st day.

Comment

Although several long series of vesicovaginal fistulæ have been reported from other countries, the present series is, I believe, the most comprehensive to be reported from Britain. Possibly it is also the most comprehensive with regard to fistulæ that had previously resisted treatment and been regarded as intractable.

All the 100 patients seen were treated, save for 1 who left the country before treatment could be started, and those showing the presence of active carcinoma.

In all the cases of *vesicovaginal fistula* the fistula was closed. The results were, almost without exception, entirely satisfactory; the one or two partial exceptions concerned cases in which bladder capacity was greatly reduced because of previous bladder operations or previous radium treatment.

In all the cases of *urethral destruction* that channel was reconstructed. In this group the restoration of normal bladder function was less certain, although sometimes

* Not included in this series was the case of a child, aged 5 years, seen in medicolegal consultation only. She had a crushed pelvis with severe bladder injury; I understand that the ureters were transplanted later.

remarkably good. In a few cases an Aldridge sling operation was effective in lessening the tendency to a continuing stress incontinence of urine.

Two classes of case were specially difficult to treat. One, as already indicated, was that in which the whole urethra and the sphincteric region of the bladder were destroyed. The other was that in which the damage was caused by radium necrosis. In these latter cases not only was the technical difficulty of the operation very great but also complete restoration of bladder function was uncertain because of the diminished bladder capacity.

With the experience gained from these varying types of case I feel justified in expressing the following opinions.

A vesicovaginal fistula, if repaired by a technique of proved merit, is, with very few exceptions, a curable lesion.

The operation of choice is a direct vaginal closure. This is much to be preferred to a transvesical or an abdominal operation, for there is less surgical trauma and much less disturbance to the patient.

If the fistula is surrounded by soft vascular tissue, its repair can be confidently undertaken by any experienced gynæcological surgeon. On the other hand, if the fistula is surrounded by dense scar tissue, or if it involves the upper urethra with destruction of the bladder neck, its treatment may be extremely difficult and should not be lightly undertaken by an operator who has not had previous experience of this class of work.

The time to close a fistula is on the occasion of the first operation; each unsuccessful operation makes subsequent surgery increasingly difficult and the result increasingly uncertain.

Summary

A hundred consecutive cases of vesicovaginal fistula are presented. In most of them (75%) there had been one or more previous attempts at surgical repair, and in many there were features that had caused the fistula to be regarded as intractable. The series does not include cases in which active carcinomatous growth was present.

In all the cases the fistula was closed. When the bladder alone was involved, the results were eminently satisfactory. When the urethra had to be completely reconstructed, the results, although occasionally excellent, were sometimes marred by continuing stress incontinence of urine.

Operation was by the vaginal route in every case of vesicovaginal and urethrovaginal fistula.

Many cases presented features of unusual clinical or anatomical interest: multiple vesicovaginal fistulæ; ureterovaginal fistulæ complicating vesicovaginal fistulæ; vesicocervical fistulæ; vesicocolic fistula complicating vesicovaginal fistula; vesical calculus complicating vesicovaginal fistula; rectovaginal fistulæ complicating vesicovaginal fistula; and inversion of the bladder through the fistula, simulating a prolapse of the uterus.

Vesicovaginal fistulæ caused by necrosis following radium treatment are especially difficult to treat, but a satisfactory result is sometimes possible.

Long duration of a fistula is not a contra-indication to surgical repair.

The size of the fistula gives no certain indication of the ease or otherwise of repair. Some large fistulæ are easily closed; some small fistulæ can present great difficulty in closure.

A plea is made for the careful and adequate treatment of vesicovaginal fistulæ at the time of their occurrence.

Addendum

My former assistant and colleague, Mr. C. Scott Russell, now professor of obstetrics and gynæcology at Sheffield University, has kindly allowed me to state that, using similar methods to mine (Russell 1951), he has dealt with 27 cases of vesicovaginal fistula, many of them supposedly "intractable." His results have been similar to those described here. All vesicovaginal fistulæ were closed by the vaginal route, and 1 case of complete destruction of the urethra was improved by a reconstruction operation. Several cases of multiple fistulæ following radium treatment were dealt with by high colpocleisis; in 1 case a very small opening remained but, while she was still under observation, this patient died from a recurrence of the carcinoma.

Since this paper was prepared I have dealt with several further cases. Thus, in altogether 130 cases of vesicovaginal fistula, a direct vaginal operation by a simple technique has been followed by satisfactory, and usually entirely successful, results.

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METABOLIC DISORDERS IN HEAD INJURY

SURVEY OF 76 CONSECUTIVE CASES

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AFTER it had been observed that patients with closed head injury sometimes show an unusual metabolic disturbance characterised by hypochloruria with hyperchlorædmia (Higgins et al. 1951), we decided to investigate a series of patients with head injury in order to assess the frequency of this disorder, to look for other metabolic disorders, and to discover their prognostic importance.

Preliminary study had revealed that biochemical changes were sometimes related to the type and method of fluid therapy rather than to intrinsic metabolic disturbances; hence from the outset patients were placed on a fluid régime designed to reduce such changes to a minimum. This régime was modified only when the treatment of some particular metabolic disorder made it necessary. The results of the investigation are now recorded and the fluid régime is described.

Patients and Methods

The investigation was made on 76 consecutive patients with major closed head injuries who remained unconscious for more than twelve hours after injury and required pernasal intragastric tube-feeding. All were admitted to the accident-service wards of the Radcliffe Infirmary, Oxford, between April, 1950, and December, 1951. During this period the total number of admissions for head injury was 612.

Throughout the period of coma the blood-urea, plasma-chloride, plasma-bicarbonate, plasma-protein, serum-sodium, serum-potassium, and serum-calcium levels, and the urinary pH, specific gravity, chloride, and urea were estimated daily at first, and later thrice, twice, and finally once weekly. In addition the urinary sodium and potassium ion levels were estimated in about a third of the patients, and the blood-sugar level in 69 of them.

Scheme of Fluid Therapy

During the first twelve hours no fluids were given other than intravenous blood-transfusion when indicated.

TABLE I—HIGHER PROTEIN DIETS

—	Quantities per day	
	I*	II* (where different from I)
Whole milk	40 oz.	..
Eggs	2	4
Full-cream dried milk	3 oz.	6 oz.
Soya flour	2 oz.	..
Glucose	4 oz.	..
Salt	2·5 g.	..
Ferrous sulphate	gr. 3	..
Aneurin hydrochloride	5 mg.	..
Riboflavine	2 mg.	..
Nicotinamide	20 mg.	..
Pyridoxine	2 mg.	..
Calcium pantothenate	3 mg.	..
Ascorbic acid	200 mg.	..
Vitamin A	4500 I.U.	..
Vitamin D	1000 I.U.	..
Carbohydrate	225	250
Protein	100	130
Fat	100	130
Calories	2200	2700

* Both diets are diluted with water to a volume of 4–6 pints, and extra sodium chloride may be added according to the patient's requirements.

Within the next twelve hours, according to individual circumstances, tube-feeding was begun with a small œsophageal tube, a Ryle's tube, or a 'Polythene' tube fitted with a rubber end, which was passed through the nose into the stomach. Tube-feeding was continued until the patient could swallow easily, when a light semi-solid diet was substituted. All the patients could be fed in this way, including those with severe facial injuries, and it was unnecessary to use the intravenous route either to maintain fluid balance or to correct biochemical abnormalities, except in 2 hypochloræmic patients, who were given plasma transfusions.

Fluid feeding began gradually. 2 oz. of water or of diluted milk was given hourly or two-hourly for from four to eight hours. Before each feed the stomach was aspirated to ensure that fluid was not accumulating there. A milk-glucose-water régime was next started, consisting of 3 pints of milk, 1–3 pints of water, and 300 g. of glucose in twenty-four hours. The glucose was dissolved in the diluted milk, and the whole given in divided doses at first two-hourly and later three-hourly. This régime provides about 2250 calories, 50 g. of protein, and 0·85 g. of sodium. Its purpose was to provide an easily assimilable diet with adequate caloric and fluid intakes, but with insufficient protein and sodium to raise the blood-urea and plasma-sodium levels, pending precise information from blood and urine analyses about the presence or the absence of metabolic disorders. Most of the patients thus received a fluid intake of at least 3 pints during the first twenty-four hours of feeding and thereafter a daily intake of 5 pints. This was increased to 6 pints if there was pyrexia, and reduced sometimes to 4 pints if the intracranial pressure was high.

After from twenty-four to forty-eight hours, unless contra-indicated by the development of hyperchloræmia, a pint of Ringer-Fischer solution was substituted for a pint of water, and the daily sodium intake thereby increased by 1·1 g. to roughly 2·0 g. This substitution was done cautiously, with daily biochemical controls in those patients whose urinary chloride level (as sodium chloride) was less than 1 g. per litre, because even oral salt may produce hyperchloræmia if the kidneys cannot excrete the chloride ion freely. This milk-glucose-Ringer régime gave rise to no complications other than rarely a mild diarrhœa, which ceased on reduction of the glucose intake to 150 g. daily, and was therefore attributed to inability to absorb all the ingested glucose.

If the blood-urea level remained normal and the patient was still in coma, a higher protein fluid diet (table I) was started on the fourth or fifth day. If the blood-urea level had been raised, this step was delayed until two consecutive daily normal blood-urea values had been obtained. This higher protein diet was diluted with as much water and Ringer-Fischer solution as was necessary to maintain an appropriate sodium intake and a daily fluid intake of 5 or 6 pints. If the blood-urea level did not rise, an even higher protein diet was given after three days. Adequate amounts of vitamins and iron were included daily in each of these two diets. Vitamin B_{12} 100 µg. was given orally each month if the patient remained in coma for a sufficient length of time. The second of these diets occasionally raised the blood-urea level, which would fall to normal if the lower protein diet was started again. The higher protein diets were well tolerated, apart from occasional mild diarrhœa which would respond to a return to the preceding régime. Thereafter patients who continued in coma were maintained on the higher protein diet plus extra sodium chloride and water until they became sufficiently conscious to swallow, or until death supervened.

Results

In assessing the results the following criteria of normality were used:

Blood-urea less than 50 mg. per 100 ml.
Plasma protein (total) 6–8 g. per 100 ml.
Non-fasting blood-sugar less than 180 mg. per 100 ml.
Serum Na^+ 130–152 m.eq. per litre.
Plasma Cl^- 90–106 m. eq. per litre.
Serum K^+ 3·6–5·4 m.eq. per litre.
Plasma-bicarbonate 20–30 m.eq. per litre.
Urinary Cl^- (as NaCl) more than 17 m.eq. per litre.
Urinary protein nil.

The patients are divided on biochemical criteria into three groups (table II): group I contains those patients in whom biochemical investigations remained normal from the time of injury to the time of recovering consciousness; group II consists of patients who showed transient biochemical abnormalities which disappeared spontaneously without specific therapy; and group III consists of patients who, in addition to transient abnormalities, showed more severe biochemical disturbances which were persistent and progressive unless reversed by specific treatment.

TABLE II—METABOLIC DISORDERS, MORTALITY, AND AGE-DISTRIBUTION OF 76 PATIENTS WITH HEAD INJURY

—	No. of patients	No. of deaths
Whole series	76	23 (30%)
Metabolic disorders:		
Group I: normal	8 (11%)	0
Group II: transient disorders	50 (66%)	12 (24%)
Group III: major disorders	18 (24%)	11 (61%)
Hyperchloræmic	9 (12%)	6 (67%)
Hypochloræmic	5 (7%)	3 (60%)
Water deprivation	2 (3%)	0
Respiratory alkalosis	2 (3%)	2 (100%)
Renal urœmia	3 (4%)	3 (100%)
Age:		
Less than 50	55 (72%)	11 (20%)
50 or more	21 (28%)	12 (57%)

GROUP I: NORMAL PATIENTS

Group I contained only 8 male patients, aged 12–35: 4 remained unconscious for less than five days, 1 for six days, 1 for eleven days, and 2 for twenty-four days. None of them died. They showed a general tendency to have high-normal urinary urea levels of more than 3 g. per 100 ml. initially, which fell to lower values (1·5–2·5 g. per 100 ml.) on the second and subsequent days, after they had received adequate caloric and fluid intakes. Only 1 patient had pyrexia above 100°F.

GROUP II: PATIENTS WITH TRANSIENT METABOLIC DISORDERS

Group II contained 50 patients: 42 males and 8 females. 12 patients (24%), 11 males and 1 female, died.

Proteinuria

Urinary protein analyses were made on 44 of the 50 patients, and proteinuria in the absence of urinary infection was found in 32. The proteinuria was transient in all the patients except a few who died within the first three days after injury. It usually began during the first twenty-four hours and continued in gradually diminishing amounts for from two to six days. The amounts present were always small, about 50 mg. per 100 ml. or less. Proteinuria was neither confined to any particular age-group nor related to the duration of unconsciousness.

Blood-urea and Urinary Urea

22 patients had a high blood-urea level, which reached a maximum usually during the first three days after injury and thereafter returned to normal. In 14 patients the maximum was 51–70 mg. per 100 ml., and in only 4 patients did it exceed 100 mg. per 100 ml. Occasionally the blood-urea level rose after the initial peak had subsided. Such a change was usually associated with the development of chest infection or with the transfer to one of the higher protein diets. Of the 18 patients with major metabolic disorders 13 also had raised blood-urea levels.

The urinary urea levels of patients with raised blood-urea levels, when estimated in urine passed within twenty-four hours of the peak blood-urea levels, were in all the patients above 1·5 g. per 100 ml., and in all but 2 above 2·5 g. per 100 ml., indicating that, in general, a high blood-urea level was of extrarenal origin.

Plasma-proteins

22 patients had at some stage a total plasma-protein level below 6·0 g. per 100 ml. In 12 patients this developed during the course of illness and returned to within the normal range if the patient recovered, but in the remaining 10 it was found during the initial examination at from twelve to thirty-six hours. It was thought unlikely that these low initial values could be attributed to head injury. It seemed more probable that the plasma-protein level had been low before the accident. Of the 18 patients with major metabolic disorders 13 also had low plasma-protein levels, 7 of them initially.

33 patients remained unconscious sufficiently long for serial observations of plasma-protein levels to be made. Three different patterns were revealed:

(1) In 9 patients, of whom 3 died, the levels did not fluctuate significantly.

(2) In 18 there was a fall from the initial value, followed by a more gradual return to normal. The period of fall was usually from three to seven days, and during this time the levels fell by 0·2–1·6 g. per 100 ml. The return to normal levels took place more gradually, starting during the period of unconsciousness but not being completed before consciousness was restored. Only 2 of these patients died: one from meningitis due to *Pseudomonas pyocyaneus*, and the other from brain-stem damage. The latter patient had improved sufficiently to speak, swallow, and sit out of bed, though with difficulty, four months after injury, and during this time the plasma-protein level rose. Then, as the patient relapsed, the plasma-protein level fell, and death took place ten months after the injury.

(3) In the remaining 6 patients the plasma-protein level rose slowly from the initial value, and all survived.

These data suggest a possible association between recovery of the patient from unconsciousness and rising plasma-protein levels. It was often observed clinically, particularly in those patients who were in coma for four weeks or more, that a rising plasma-protein level would begin during the unconscious period and might even precede definite clinical signs of recovery. Such a rise may therefore be one of the earliest indications of returning consciousness and be of good prognostic significance.

Blood and Urinary Glucose

Of the 50 patients of group II 12 exhibited a transient glucosuria during the first forty-eight hours after injury. Non-fasting blood-sugar levels were below 180 mg. per 100 ml. in 11 of these patients. In the other patient a blood-sugar level of 201 mg. per 100 ml. was found on the day of injury, indicating transient true hyperglycæmia. Of 10 patients in group III in whom blood-glucose and urinary glucose analyses were made, 5 showed transient glucosuria, and 2 of these (cases 2 and 6) true hyperglycæmia. The biochemical data of both are given in table III.

These observations indicate that transient glucosuria of the low-renal-threshold type may develop in about 30% of patients with closed head injury who remain

TABLE III—BIOCHEMICAL DATA OF PATIENTS ILLUSTRATING METABOLIC DISORDERS DESCRIBED IN TEXT

Case no.	Metabolic disorder	Days after accident	Blood analyses							Urine analyses					
			Plasma Cl^- (m.eq. per litre)	Plasma HCO_3^- (m.eq. per litre)	Serum Na^+ (m.eq. per litre)	Serum K^+ (m.eq. per litre)	Plasma-protein (g. per 100 ml.)	Blood-urea (mg. per 100 ml.)	Blood-sugar (mg. per 100 ml.)	pH	Cl^- (m.eq. per litre)	Na^+ (m.eq. per litre)	K^+ (m.eq. per litre)	Urea (g. per 100 ml.)	Sugar
1	Hyperchloræmia with hypochloruria	4	126	18	..	..	6·2	130	..	5·6	3	0	77	3·5	0
		5	111	..	154	5·4	..	139	..	5·8	7	7	90	3·06	0
		6	108	19	..	..	5·4	94	..	5·6	5	26	57	3·2	0
		7	..	..	..	..	..	88	99	5·8	9	8	102	3·7	..
		8	103	18	155	4·7	5·1	68	..	5·5	12	8	92	3·1	0
		10	103	18	..	..	..	..	..	5·4	24	17	102	2·8	0
2	Hypochloræmia with hyperchloruria and hyperglycæmia	1	98	20	135	3·9	5·4	52	184	..	103	..	..	2·5	Trace
		12	82	..	..	..	4·8	39	..	6·6	24	..	..	2·4	0
		15	85	22	120	5·4	4·7	28	..	6·6	29	..	..	1·8	0
		63	92	25	128	4·7	5·4	26	115	7·3	79	..	..	1·2	0
		66	89	..	..	4·6	5·1	18	..	8·0	89	109	146	1·3	0
		78	84	21	128	4·9	5·1	18	..	8·0	171	..	..	1·4	0
		107	97	20	140	4·1	5·0	30	..	7·9	73	..	..	2·1	0
3	Water deprivation	6	108	21	165	3·7	5·9	40	..	5·5	75	96	154	4·3	Trace
		7	108	..	..	..	..	42	113	..	..	..	..	..	..
		8	105	22	..	3·7	5·6	40	..	6·6	127	139	92	4·0	0
4	Respiratory alkalosis with renal uræmia	2	109	10	140	4·7	4·9	59	150	7·4	5	..	..	0·4	0
		3	98	13	..	..	..	124	150	..	..	..	..	..	..
5	Renal uræmia with hyperchloræmia and hypochloruria	1	112	17	159	4·0	5·8	51	133	6·0	0	..	..	1·1	Trace
		2	109	..	..	..	..	161	..	6·0	15	..	..	1·4	0
		3	104	16	..	..	..	274	149	..	..	..	..	..	..
6	Hyperglycæmia with hyperchloræmia and hypochloruria	7	120	21	172	4·6	..	88	..	6·4	10	6	69	3·75	+
		8	117	24	181	5·1	5·8	84	278	6·4	5	5	33	2·8	+

unconscious for twelve hours or more. Glucosuria with hyperglycæmia may also develop in a few patients.*

GROUP III : PATIENTS WITH MAJOR METABOLIC DISORDERS

Of the 18 patients in this group 15 were males and 3 females. There were 11 deaths (61%), a much higher rate than in the other groups. The biochemical disturbances of this group were not mutually exclusive, 3 patients each developing more than one.

Hyperchloræmia and Hypochloruria

9 patients (12% of the whole series), 1 of whom was included in our previous communication (Higgins et al. 1951), had this syndrome. Their ages were spread fairly evenly from 19 to 81. 8 were men, 6 of whom eventually died, 2 males and 1 female surviving. One of these patients also had respiratory alkalosis, and another renal uræmia.

The biochemical findings (table III) are essentially the same as those described previously (Higgins et al. 1951) and have been extended in the 8 new cases reported here :

(1) Urinary sodium and potassium levels were estimated in 5 patients. The urinary excretion of sodium and that of chloride were closely similar. In twelve specimens of urine, examined during hyperchloræmia, in which the urinary chloride level (as NaCl) was less than 1·0 g. per litre, the urinary sodium level was 0·6 g. per litre (26 m.eq. per litre) or less, and usually about 0·2 g. per litre (9 m.eq. per litre). The urinary potassium level, however, was always much higher, varying, in the same twelve specimens, from 1·3 to 5·8 g. per litre (33–149 m.eq. per litre). There is therefore no inability to excrete this ion.

(2) Blood-sugar levels were estimated during the periods of hyperchloræmia in 8 patients. In only 1 patient was the level above 180 mg. per 100 ml., a value of 278 mg. per 100 ml. being obtained on the sixth day after injury. This patient had persistent glucosuria until death. With this exception the normal blood-sugar values obtained appear to be further evidence against the hyperchloræmic syndrome being part of the general adaptation syndrome of Selye (1950).

(3) Necropsies on the present 5 patients and the 6 previously reported patients (Higgins et al. 1951) who died after having hyperchloræmia reveal that none showed gross abnormalities of the kidneys either macroscopically or microscopically. On examination of the brain a constant macroscopic finding was contusion of the under surface of the frontal lobes in every case, but there was also damage to the brain elsewhere. The pituitary glands of 9 patients were examined, and hæmorrhage or thrombosis was present in 6. On the other hand, the pituitary gland was found to be damaged similarly in 4 of 12 patients with head injury who did not have hyperchloræmia. The association of hyperchloræmia with damage to the under surface of the frontal lobes was noted and discussed previously (Higgins et al. 1951), and is now confirmed in 5 more patients.

Treatment.—We tried to reverse the metabolic abnormalities of this syndrome by modifying the basic scheme of fluid therapy. No sodium chloride was given throughout the period of hyperchloræmia, apart from that present in milk. A fairly high fluid intake of six or seven pints daily was maintained in an attempt to increase the total loss of sodium and chloride ions via the kidney and thus to reduce the plasma-chloride level. The patients usually received three pints of milk, three or four pints of water, and 300 g. of glucose daily. A pint of Ringer-Fischer solution was substituted cautiously for a pint of water when the plasma-sodium and plasma-chloride levels had fallen to normal, so as to test whether the ability to excrete sodium and chloride ions had returned. When the urinary excretion of chloride became normal, further treatment was given according to the basic scheme.

Results of treatment.—Of the 9 patients in this group 6 recovered from hyperchloræmia when placed on the above régime, but 3 eventually died. They regained the power of excreting sodium and chloride ions in the urine and of maintaining normal plasma levels on an intake of at least 5 g. of NaCl daily. This correction usually took from three to six days. Of the 3 patients whose hyperchloræmia was uncorrected 2 died within forty-eight hours. In the 3rd, however, the chloride and sodium levels continued to rise and, on the day before death, had reached 137 and 183 m.eq. per litre respectively despite absence of NaCl from the diet. The recovery-rate of these patients compared favourably with the deaths of the first 6 patients previously reported (Higgins et al. 1951).

Comment.—In the earlier communication we concluded that the primary defect of this syndrome was an inability of the kidney to excrete the chloride ion. The present survey confirms these findings and shows that the kidney is also unable to excrete sodium ions. Borst (1951) commented on our previous paper (Higgins et al. 1951) and restated the hypothesis that hypernatræmia and hyperchloræmia result from the combination of water deficiency (caused by excessive diuresis to excrete urea) with a homœostatic mechanism tending to preserve the volume of circulating fluid. A careful clinical study of our patients has, however, failed to reveal evidence of reduced blood volume or of dehydration. They do not present the picture of peripheral circulatory failure, intra-ocular tension is normal, none of them had a diuresis, and 1 had mild but definite œdema. Many of the patients were admitted shortly after injury, and the dietary régime described above was adopted. It is difficult to see in what way they could become severely dehydrated or suffer a deficiency in volume of the circulating blood, especially when so many others in similar circumstances did not do so. It appears, moreover, that when water deficiency raises the plasma-sodium and plasma-chloride levels, the urinary concentrations of sodium and chloride should be increased (Gamble 1950, McCance et al. 1944), in the early stages at least. Borst (1948) and Borst and de Vries (1950) described 2 patients with lobar pneumonia and 3 with peritonitis in whom the urinary excretion of sodium chloride was totally suppressed, the blood-sodium and blood-chloride levels were high, and there did not appear to be any reduction of cardiac output or of circulatory volume. Their patients more closely resemble our hyperchloræmic patients. These workers attribute the findings to pyrexia ; but pyrexia was not constant in our hyperchloræmic patients. Cooper and McCarty (1951) have described 3 patients with hypernatræmia, hyperchloræmia, and hypochloruria. 2 had undergone surgical removal of a pituitary tumour, and the 3rd had thrombosis of the left middle cerebral artery. These workers, like us, could not find clinical evidence of dehydration. It therefore seems that diminished circulatory volume is only one of perhaps several causes of hyperchloræmia with hypochloruria, and that another explanation for our results should be sought. The possible rôle of damage to the under surface of the frontal lobes in the production of hyperchloræmia is discussed below.

Hypochloræmia and Hyperchloruria

5 patients had this syndrome. Some of the biochemical details of 1 of them are given in table III. All were elderly males, being aged 66, 67, 68, 83, and 84. The

*One other patient, a woman aged 63, was found, after head injury, to have profuse glucosuria with hyperglycæmia (283 mg. per 100 ml.) She was not previously known to be diabetic and had not, before injury, shown any of the symptoms of diabetes. The hyperglycæmia and glucosuria were controlled with insulin, which the patient still requires two years after head injury. The insulin dosage during this period has remained virtually unchanged. It is possible that head injury may directly have caused this permanent diabetes or that she was an unknown diabetic before the injury. Because of this uncertainty she has been omitted from the glucosuric group of patients.

eldest 3 died. The characteristic biochemical feature of this syndrome is a relatively high level of sodium and chloride ions in the urine—NaCl more than 1 g. per litre (17 m.eq. per litre)—when the plasma-chloride level is below 525 mg. per 100 ml. (90 m.eq. per litre) and the serum-Na^+ below 300 mg. per 100 ml. (130 m.eq. per litre). As may be seen from table III the urinary chloride may increase to 8 g. per litre (136 m.eq. per litre) or more, despite low plasma-chloride levels. In 3 patients the blood-urea level remained normal, except for isolated readings, after the first few days after injury. The urinary urea reached levels of at least 2·5 g. per 100 ml. in all 5 patients, indicating that the capacity of the kidneys to excrete urea was reasonably well maintained. There was neither clinical nor biochemical evidence of acidosis or of alkalosis.

Clinically these patients had a dry tongue, sunken cheeks, loss of skin turgor, and reduced intra-ocular tension, and became salt-deficient. It was almost as if they had Addison's disease, but there was no pigmentation of skin or of mucosæ, the serum-potassium ion level was normal or subnormal, and blood-sugar levels in 3 of the 5 patients were always above 80 mg. per 100 ml. The 2 patients who recovered had no subsequent adrenal deficiency.

Unlike the other major metabolic disorders, this syndrome did not develop within the first few days of injury but after from seven to twelve days. In the 3 patients who died the syndrome lasted from one to three months. In the 2 who recovered it lasted for three weeks and a month.

Treatment.—Patients were given a high sodium-chloride intake as soon as the diagnosis was made. Three pints of Ringer-Fischer solution was substituted for three pints of water in the diet, and additional solid sodium chloride, in one instance 15 g. daily, was dissolved in the diet, sometimes as much as 25 g. of sodium chloride (10 g. of sodium) being given daily in an effort to counterbalance the urinary loss. In some patients deoxycortone acetate and 'Eucortone' were injected in an attempt to raise persistently low plasma-sodium and plasma-chloride levels. In 2 patients, because of very low plasma-protein levels (below 5 g. per 100 ml.), plasma transfusions were also given.

Results of treatment.—Treatment of the hypochloræmic syndrome was less successful than that of hyperchloræmia. In all the cases the progressive fall of plasma-sodium and plasma-chloride levels was halted by the provision of a high sodium diet (10–25 g. of NaCl), and the signs of dehydration disappeared. It was exceedingly difficult, however, to restore the plasma levels to normal. Within forty-eight hours of the start of the high sodium diet they rose a little but thereafter they remained subnormal for up to three months with small unpredictable fluctuations. The excess dietary sodium was either excreted in the urine or partially retained in the body as œdema fluid. Deoxycortone acetate, eucortone, and cortisone were also ineffective in raising the plasma-sodium and plasma-chloride levels. Their use in 2 patients led only to further retention of dietary sodium as visible œdema. High-protein diets and sometimes plasma transfusions raised the plasma-protein levels slightly in all the patients but had no effect in restoring the lowered plasma-sodium and plasma-chloride levels. In 2 of the 3 patients who died there was an unaccountable but definite rise of the plasma-sodium and plasma-chloride levels to normal two days before death. The impression was that, although treatment with a high sodium diet would prevent progression of hypochloræmia and produce rehydration, it would not restore the plasma levels to normal; nor would treatment with adrenal cortical hormones. The restoration of normal levels, when it took place, seemed to depend on quite different and as yet unknown factors.

Comment.—This syndrome appears to be confined to older patients, since it was found in 5 of the 15 patients aged 61 or more but not at all in the 61 younger patients. It develops gradually over a period of from seven to twelve days after injury. The hyperchloræmic syndrome, on the other hand, develops more quickly and develops at all ages.

The cause of the excessive urinary loss of sodium and chloride is unknown. There is a close resemblance between this syndrome and Addison's disease, and the possibility of adrenal damage must be considered. The lack of response to sodium chloride, eucortone, deoxycortone acetate, and cortisone argues against such a cause. Unfortunately, specific tests of pituitary and adrenal function were not made. Winkler and Crankshaw (1938) have described patients with pulmonary tuberculosis, carcinoma of the lung, and arteriosclerotic heart-disease who had low plasma-sodium and plasma-chloride levels and continued to excrete chloride in the urine, although not in such large amounts as did our patients. Salt-losing lesions in chronic nephritis have also been described. The kidneys of 1 of our hypochloræmic patients were examined post mortem and showed no gross pathological changes macroscopically or microscopically. The precise cause of this syndrome, like that of the hyperchloræmic syndrome, awaits further investigation.

Water Deficiency

Water deficiency developed in two groups of patients: those in whom adequate fluid intake before admission had not been maintained; and those in whom water deprivation was undertaken deliberately to reduce intracranial pressure. This latter group has not been included among the major metabolic disorders, because in it the water deficiency developed essentially as the result of treatment.

2 patients in this series, who were transferred to the Radcliffe Infirmary for further treatment eight days and five days after injury, showed evidence of water deprivation. The biochemical data of 1 of them (case 3) are given in table III. In both patients the history showed that there had been difficulty in maintaining an adequate fluid intake, and in 1 patient a pyrexia of 100–101°F had exaggerated this deficiency. Clinically both had dry mouths and tongues, loss of skin turgor, and reduced intra-ocular pressure. The essential biochemical findings were raised serum-sodium and plasma-chloride ion levels, with urinary sodium and chloride levels greater than 17 m.eq. per litre. In 1 patient the initial serum-potassium level was slightly subnormal. In neither patient was the total plasma-protein level raised as might have been expected. The most likely explanation of this is that plasma-proteins had been drawn on as a source of energy during the preceding days. On rehydration, however, there was in each case a slight fall in the plasma-protein level. The biochemical findings in patients made water-deficient during treatment were essentially the same as those in these 2 patients. Water deprivation was diagnosed clinically in 6 other patients but was too mild to give rise to biochemical abnormalities.

Treatment.—The basic scheme was modified by giving extra water to increase the daily fluid intake to a total of seven or eight pints. Water deficiency was thus relieved in both patients within forty-eight to seventy-two hours.

Comment.—Water deprivation is a well-recognised metabolic disorder after head injury (Munro 1938) and seems to be produced by inadequate fluid intake resulting from inability of the comatose patient to swallow, and may be accelerated by pyrexia and hyperpnœa. Since it can be prevented by adequate fluid therapy it may be considered to be a sequel of the management of head injury rather than of the injury itself.

Respiratory Alkalosis

Sometimes in severe head injury, particularly where there is evidence of brain-stem damage, irritation of the respiratory centre may develop and produce alternating periods of intense hyperpnœa and hypopnœa. Hyperpnœa, if sufficiently prolonged, will cause alkalosis with a low plasma-bicarbonate level. Although many of our patients had periodic respiration, in only 2 did unequivocal evidence of alkalosis develop. This was to be expected because the periods of hypopnœa normally compensate for the alkalosis produced during hyperpnœa. In these 2 patients, however, the periods of hyperpnœa were prolonged and the periods of relative hypopnœa insufficient for adequate compensation. Both patients showed intense muscular irritability, with spasms of spontaneous contractions, particularly of the face and hands, which resembled tetany but did not give the precise hand shape usually associated with this condition. These spasms were associated with hyperpnœa and were also seen towards the end of a period of hyperpnœa in patients who did not develop persistent alkalosis.

Both patients were young men, aged 19 and 29, and both died. The biochemical findings in 1 of them (case 4) are shown in table III. The low plasma-bicarbonate level and the alkaline urine indicated respiratory alkalosis. In this patient the raised plasma-chloride level in the presence of hypochloruria was an adaptation to the alkalosis. Hyperchloræmia compensates for the low plasma-bicarbonate level, and hypochloruria reflects the excretion of potassium and sodium ions with phosphate and weakly dissociated acids, making the urine alkaline. Unless this is recognised, confusion with the hyperchloræmic-hypochloruric syndrome may arise. In this patient the low urinary urea level accompanying a rising blood-urea level indicated a second biochemical defect, renal uræmia.

Treatment.—Respiratory alkalosis did not call for modification of the fluid régime. The most effective treatment was to attempt to reduce the hyperactivity of the respiratory centre. This was accomplished in 1 patient by the intramuscular injection of phenobarbitone. Inhalation of carbon dioxide was considered as a means of raising the low alkali reserve but was rejected because of its vasodilator effect on cerebral vessels.

Renal Uræmia

The characteristic biochemical disorder in renal uræmia is an inability to concentrate urea in the urine in the presence of a raised blood-urea level (see table III). 3 patients had this syndrome, and all died. 2 were men aged 29 and 52, and the third was a woman aged 23. All had suffered severe head injuries with brain-stem damage. The elder man had also received multiple compound fractures of both limbs and developed proteinuria and progressive oliguria. Clinically and biochemically his condition was somewhat similar to that of the "crush syndrome" without, however, showing the typical urinary excretion of pigment.

The blood-urea and urinary urea levels of 2 of the patients (cases 4 and 5) are given in table III. In the 3rd patient the blood-urea level rose to 184 mg. per 100 ml., but the highest level of urea observed in the urine was only 0·9 g. per 100 ml. The hyperchloræmic syndrome also developed in 1 patient, and respiratory alkalosis in another. Proteinuria and oliguria developed in only 1 patient.

In each patient the blood-urea level progressively rose and death took place on the second or third day after injury. At necropsy no gross pathological changes were seen in the kidneys; nor were the histological appearances typical of the "crush syndrome."

Treatment.—As soon as it was known that these patients could not concentrate urea in their urine, the basic diet was discontinued, and a daily régime was started of 100 g. of peanut oil and 400 g. of glucose, which were emulsified in a litre of water, diluted with extra water and salt as required, and given by continuous intragastric drip. This diet contains 2500 calories but no protein, and reduces the production of urea in the body to a minimum, pending the return of normal renal function.

Results of treatment.—In each of the patients with renal uræmia the Borst diet did not prevent a rise of blood-urea level; but in 2 of them it was only started a few hours before death, and therefore its therapeutic usefulness cannot yet be assessed.

Comment.—It is typical of the extrarenal uræmias that the level of urea in the urine is high. Since the reverse holds good in this syndrome, it has been felt advisable to classify the disorder as a renal uræmia, though there was no macroscopic or microscopic evidence of gross renal disease at necropsy. There seems to be no precise parallel to this syndrome in published reports, and its cause remains obscure. Cumings (1942) has described uræmia developing after head injury but with relatively high urinary urea levels. It has long been known, however, that metabolic alkalosis may produce at first reversible renal damage and ultimately calcification of renal substance (Cooke 1932, 1933). Since all 3 patients had hyperpnœa and low or low-normal plasma-bicarbonate levels, there may perhaps be some connection between respiratory alkalosis and the inability to concentrate urea adequately. However, other patients with brain-stem damage had low-normal plasma-bicarbonate levels without any inability to excrete urea.

TABLE IV—RELATIONSHIP OF DURATION OF COMA TO MORTALITY

—	Duration of coma (days)				
	1–5	6–10	11–20	21–40	More than 40
Total no. of patients ..	27	12	17	9	11
No. recovering consciousness	16	9	15	9	4
No. of deaths..	11 (41%)	3 (25%)	2 (12%)	0	7 (64%)

Discussion

The present investigation reveals that after a closed head injury there are a high incidence and a wide variety of biochemical disturbances in patients who survive the immediate effects of injury but remain unconscious for longer than twelve hours, because only 11% remained biochemically normal within the limits of our investigations. The abnormalities usually arose immediately after, or within a few days of, the initial injury, except water deficiency, the hypochloræmic-hyperchloruric syndrome, and changes of plasma-protein level, which developed more slowly. The possibility that metabolic disturbances, particularly the transient ones, may also arise in patients with less severe injuries who recover consciousness quickly is not excluded, but so far we have not investigated this group of patients biochemically.

RELATION OF METABOLIC DISORDERS TO MORTALITY

The fate of the 76 patients is summarised in tables II and IV. The death-rate for the series was 30% and, although it was impossible to assess accurately the effect of these metabolic disorders on the death-rate, it should be observed that, whereas there were no deaths among those whose biochemical findings remained normal, the mortality in those with transient disorders was 24% and in those with major disorders 61%. During the period of this survey the number of admissions for head injury was 612, with 50 deaths (8%). These facts indicate that metabolic disorders after head injury are associated with increased mortality. As might be anticipated, there is a higher mortality with increasing age (see table II). Table IV shows that about half the deaths took place during the first five days, but thereafter the longer the

duration of coma the smaller was the proportion of deaths up to a period of about forty days, after which the mortality increased considerably. This trend was seen at all ages. These results emphasise the importance of maintaining the patient's health, particularly during the first six weeks after injury.

ÆTIOLOGY OF METABOLIC DISORDERS

The cause of the individual major metabolic disorders has already been discussed in the sections devoted to each. When all the abnormalities are considered together in relation to the initial head injury they appear to fall into several ætiological groups. Respiratory alkalosis appears to be a direct sequel of damage to a particular part of the brain. Water deprivation is, on the other hand, a result of the coma which may follow any head injury. Raised blood-urea and lowered plasma-protein levels are probably partly at least due to the non-specific katabolic reaction of the body to trauma and rest in bed which is known to develop after fractures and surgical operations. A fourth ætiological group of disorders is that resulting from renal dysfunction in the absence of evidence of renal damage. Proteinuria and renal glycosuria form obvious examples of renal dysfunction, but hyperchloræmia, hypochloræmia, and renal uræmia also indicate renal inability to correct an abnormal internal environment. The extent to which renal dysfunction is of extrarenal or intrarenal origin is a matter for further investigation, as is also the means by which injury to the head provokes dysfunction of the kidneys. Evidence of a direct relationship between brain and kidney is accumulating. Sweet et al. (1948) reported hyperchloræmia in 4 patients after operation on the frontal lobes. Hoff et al. (1951) produced renal cortical ischæmia by electrical stimulation of foci on the anterior sigmoid gyri of the cerebral cortex of cats, and Cort (1953) has demonstrated in the cat a reduction in the oxygen and carbon-dioxide arteriovenous differences across the kidney following stimulation of the supra-orbital cortex. In view of these facts, the observation that all 11 patients dying after hyperchloræmia showed damage to the under surface of the frontal lobes suggests that damage to this part of the brain may possibly provoke renal dysfunction, though it gives no idea of the intermediate steps in the process.

An important practical point arises from these observations of renal dysfunction following head injury. Throughout the treatment of head injury the possibility of renal disability must be kept in mind, and forms of treatment, particularly intravenous transfusions of electrolytes and plasma substitutes, which would be hazardous in renal disease, must be undertaken with circumspection.

NEED FOR RECOGNITION AND TREATMENT OF METABOLIC DISORDERS

Owing to the complex setting in which these disorders arise and the effects of other complications, both intracranial and extracranial, which may also be present, it is impossible to demonstrate statistically the value of the metabolic measures which have been described in the treatment of the metabolic disorders. Nevertheless there is certain collateral evidence for their effectiveness:

(1) Patients will die from prolonged coma from whatever cause, unless their nutritional needs are satisfied. In this series 20 patients remained in coma for more than three weeks, of whom 13 recovered: 9 were in coma from three to six weeks, 5 from six weeks to three months, 4 from three to six months, and 2 more than six months. Of those who died, although all showed some muscular wasting and loss of weight, in only 2 was it felt that body wasting contributed to the patient's death. That some patients could recover after such periods of coma indicates the value of, and the necessity for, a régime which will maintain for indefinite periods the optimal conditions for maximal improvement.

(2) One may also consider the mortality associated with similar metabolic disorders developing in circumstances other than head injury. For example, hyperchloræmia with hypochloruria has been described in various conditions and is associated with a high death-rate (Higgins et al. 1951, Taylor 1951). The recognition of 9 such cases in this series and the successful correction of the disorder in 6 are therefore significant. To what extent the fluid régime adopted has prevented a greater incidence of this disorder or of others is unknown, but it is important to note that in this series there was a small group of patients who, for some days after the head injury, persistently excreted minute amounts of chloride and sodium ions in the urine while maintaining high-normal plasma levels. Clinically it appeared that, had they been given sodium chloride, the hyperchloræmic syndrome would have developed. In each case the excretion of sodium and chloride apparently increased spontaneously after three or four days.

(3) Finally, it should be noted that of the 18 patients with major metabolic disorders, therapeutic correction was successful in 12, of whom 7 survived.

Such considerations, together with the clinical impressions gained during the treatment of these 76 patients, suggest that attention to the metabolic requirements of the patient and the prevention and correction of metabolic disorders do play a part in lowering the over-all mortality from head injuries and should form an integral part of their basic management.

Summary

Biochemical findings are described in 76 patients with closed head injury who remained unconscious for longer than twelve hours after injury.

8 patients remained biochemically normal within the limits of our investigation during their periods of coma. 50 patients exhibited one or more transient metabolic disorders, which disappeared without specific treatment. 18 patients developed major metabolic disorders which were persistent and progressive unless reversed by specific treatment.

The transient disorders which developed were proteinuria, hyperglycæmia, renal glycosuria, a raised blood-urea level, and a low total plasma-protein level.

The major disorders were hyperchloræmia with hypochloruria, hypochloræmia with hyperchloruria, water deprivation, respiratory alkalosis, and renal uræmia.

The régime of fluid therapy used in the management of the unconscious patient is described, together with the modifications adopted in the treatment of those with major metabolic disorders.

It is suggested that metabolic disorders play a part in the mortality of head injury, and that their prevention and correction should form an integral part of the basic management of this condition.

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ESTIMATION OF PLASMA-INSULIN BY THE RAT DIAPHRAGM METHOD

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SMALL amounts of insulin accelerate both the utilisation of glucose and the synthesis of glycogen by the isolated rat diaphragm (Gemmill 1939, 1941). Stadie and Zapp (1947) and Krahl and Park (1948) have found a quantitative relationship between the amount of insulin in the incubation medium and its effects on the glucose metabolism of the diaphragm.

In recent years several investigators have attempted to use this technique for estimating insulin in blood. Groen et al. (1952) found that glucose utilisation was significantly increased with concentrations of insulin as low as 5×10^{-6} units per ml.; normal human serum contained between $6{\cdot}25\times10^{-5}$ and $6{\cdot}25\times10^{-4}$ units of insulin per ml. By experiments with dog's serum before and after pancreatectomy they satisfactorily showed that what was being estimated was indeed insulin. This was further confirmed by inhibiting the insulin effect with cysteine and glutathione, insulin losing its activity in the presence of such SH compounds.

Marsh and Haugaard (1952), using substantially the same technique, found an anti-insulin effect in normal human serum. Moreover Perlmutter et al. (1952), again with the same technique, were unable to estimate the insulin content of normal human serum, even after the injection of 25 g. glucose intravenously.

Despite these conflicting reports, it seemed to us that the method offered possibilities for the estimation of insulin in blood, provided that the experimental conditions could be standardised.

Method

Handling of Diaphragms

Male and female albino rats weighing 120–150 g. were used in all the experiments; in any one experiment rats of the same sex and approximately the same weight were used. The rats were maintained under standard dietetic and environmental conditions and fasted for twenty-four hours before the diaphragms were removed.

The animals were killed by a blow on the head; the abdomen was opened and the diaphragm carefully excised. It was placed immediately in ice-cold balanced salt solution (B.S.S.) (Gey and Gey 1936). The diaphragm, while so immersed, was divided into two approximately equal halves, the thick posterior portion being discarded. The hemidiaphragms remained in the B.S.S. for fifteen to twenty minutes.

Solution

Glucose was added to another batch of B.S.S. to make the final concentration 300 mg. per 100 ml. Hereafter this solution will be called G.B.S.S.

Five-times recrystallised insulin 23·2 units per mg. (Boots) was dissolved in distilled water previously adjusted to pH 2·8 with glacial acetic acid, making the final concentration 50 units per ml. This stock was diluted with G.B.S.S. to an insulin concentration of 1 unit per ml., and serial dilutions were made with G.B.S.S. down to 10^{-5} units per ml. These constituted our standard insulin solutions.

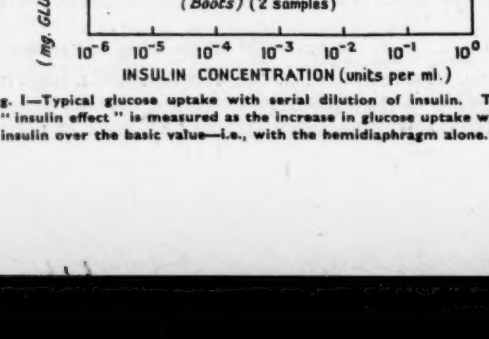
'INSULIN EFFECT' (mg. GLUCOSE per 100 ml. per 10 mg. dry weight diaphragm)
20
15
10
5
Five-times recrystallised insulin
Commercial insulin, 80 units per ml. (Boots) (2 samples)
10⁻⁶ 10⁻⁵ 10⁻⁴ 10⁻³ 10⁻² 10⁻¹ 10⁰
INSULIN CONCENTRATION (units per ml.)

Fig. 1—Typical glucose uptake with serial dilution of insulin. The "insulin effect" is measured as the increase in glucose uptake with insulin over the basic value—i.e., with the hemidiaphragm alone.

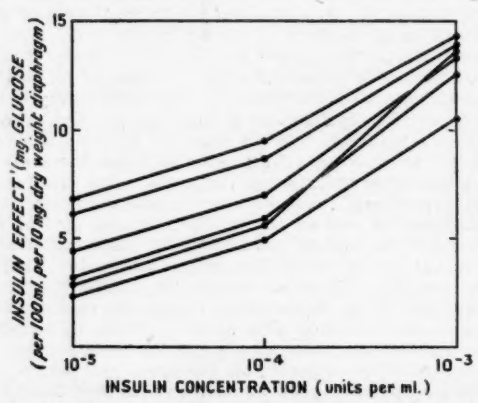

Fig. 2—Results of six experiments on different days with the lower insulin concentrations. It indicates the constancy of the results on any one day but emphasises the pronounced day-to-day variation.

Incubation and Estimation

2 ml. of G.B.S.S. or standard insulin solution was placed in a Warburg cup and one hemidiaphragm, after gentle blotting, was added. The prepared cups were then attached to Warburg manometers and gassed for five minutes with 95% oxygen and 5% carbon dioxide. The cups were incubated in a water-bath at 37·2°C and shaken at a rate of 90 oscillations per minute, with an amplitude of 5 cm., for ninety minutes. At the end of this time the residual glucose was estimated in each cup by Harding's modification of the Schaffer-Hartman method (King 1951), with duplicates for each cup.

The diaphragms were removed, rinsed in water, dried in an oven at 105°C for two hours, and then weighed. The final glucose uptake over the incubation period was calculated in mg. per 100 ml. per 10 mg. dry weight of diaphragm.

Handling of Human Plasma

Venous blood was drawn off in a heparinised syringe, the blood sugar estimated, and the plasma separated; it was then left at 2°C until required. Plasma was added to a previously weighed quantity of glucose to make a final concentration 300 mg. per 100 ml. Thereafter, the plasma was handled in the same way as the standard insulin solutions; without dilution 2 ml. was placed in each cup and the glucose uptake of the diaphragm measured as before.

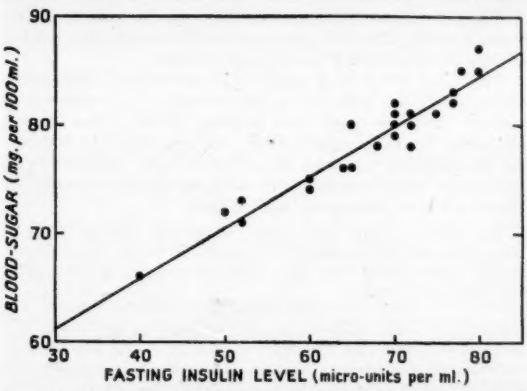

Fig. 3—Insulin levels in normal fasting subjects, indicating the apparent relationship between these values and their corresponding blood-sugar levels. Apart from the above values the plasma from 3 subjects had less than 10 micro-units per ml. A further 2 had values of 150 and 200 micro-units per ml., but in these 2 the blood-sugar levels were outside the normal fasting range.

Results

Basal Glucose Uptake of Diaphragms

The optimum dry weight of the hemidiaphragms for the basal uptake of glucose was found to be 20–26 mg., and such diaphragms were obtained from rats weighing 120–150 g. At this weight the glucose uptake is large enough to be measured easily; with larger diaphragms results are irregular, probably owing to poor diffusion into the muscle. Provided the rats and the hemidiaphragms obtained from them were reasonably comparable in weight, then the basal glucose uptake for each hemidiaphragm was fairly constant for any one experimental day; the maximum difference between replicate estimations did not exceed 3·5%. The basal uptake is increased with an increase in surface area, and thus care must be taken while removing and trimming the diaphragm, to avoid serrating the edges. Constant results were not obtained with hemidiaphragms from rats weighing less than 110 g., probably because of the difficulty of removing them satisfactorily.

Although the basal glucose uptake remained reasonably constant for the hemidiaphragms on any one experimental day, there was usually a considerable day-to-day variation—of up to 30%—on different diaphragms, even though the diaphragm weights were similar.

We have tried using quarter-diaphragms and found that the basal uptake, weight for weight, was greater than with hemidiaphragms. Subsequently, like Groen et al. (1952), we found that the insulin sensitivity was considerably less. Quarter-diaphragms have therefore not been used.

TABLE I—PLASMA-INSULIN LEVELS ONE HOUR AFTER 50 G. GLUCOSE ORALLY FOLLOWING A TWELVE-HOUR FASTING PERIOD

Fasting	One hour after 50 g. glucose orally	
Plasma-insulin (micro-units per ml.)	Plasma-insulin (micro-units per ml.)	Blood-sugar (mg. per 100 ml.)
70	130	64
65	130	67
64	140	75
85	170	80
40	570	85
72	<10*	87
<10	10	93
65	800	93
70	780	98
72	790	101
—	770	107
52	280	107
150	750	112
—	800	116
80	650	127
60	590	127
70	250	150

*Done on two separate occasions.

Glucose Uptake with Serial Insulin Dilution

Serial dilutions of five-times recrystallised insulin were made from 10^{0} to 10^{-5} units per ml. The hemidiaphragms showed a significantly increased uptake of glucose down to 10^{-5} units per ml. The average increase over the basal uptake at this lower level was 5 mg. per 100 ml. per 10 mg. diaphragm, the lowest value being 2·4 mg. per 100 ml. per 10 mg. diaphragm. The uptakes with rising concentrations increased correspondingly until an apparent maximal glucose uptake was reached. Commercial insulin (Boots) 80 units per ml. was used in a few initial experiments, and it was found that, at concentrations from 10^{0} to 10^{-5} units per ml. the insulin effect varied considerably but was usually not as great as the effect obtained with the five-times recrystallised insulin in the same dilutions. This appears to indicate that the standard commercial product contains glucagon impurity which loses its effect at the lower concentration (fig. 1).

After these pilot experiments through the whole range of insulin dilution, attention was concentrated on standards 10^{-3}, 10^{-4}, and 10^{-5} units per ml. as these were expected to be the most useful when estimating blood insulin.

Although there was a fluctuation in the absolute uptake at each dilution from day to day, the differences in uptake between 10^{-5} and 10^{-4}, and 10^{-4} and 10^{-3} units per ml. remained remarkably constant, and when done in duplicate on the same day were similar (fig. 2).

TABLE II—ESTIMATION OF KNOWN AMOUNTS OF INSULIN ADDED TO PLASMA FROM A FASTING SUBJECT

Plasma-insulin level (micro-units per ml.)	Known added insulin (micro-units per ml.)	Plasma + added insulin level (micro-units per ml.)
50	60	100
77	60	120
80	100	170
60	200	260
70	200	300
80	200	250
80	200	300
67	400	450
77	400	430
80	400	430
67	600	640
68	600	700
75	600	690

Plasma Values

The uptake of glucose from the plasma samples was compared directly with the values obtained with the standard insulin solutions, a graph being constructed for the latter values each day.

Two main series of experiments were carried out on normal subjects, mainly young male medical colleagues. Blood was taken from the first group at 8.30 A.M. after starving for the previous twelve hours. In the second group blood was taken from a fasting subject as before and 50 g. glucose dissolved in 200 ml. distilled water given immediately by mouth. A further sample of blood was taken after one hour. The results obtained are shown in fig. 3 and table I.

Inhibition and Recovery of Insulin

Cysteine and glutathione in a final concentration of *M*/50 and *M*/45 respectively inhibited the insulin effect in plasma and standard solutions, the glucose uptake being equivalent to the basal level.

Known quantities of insulin have been added to normal plasma on several occasions and this extra amount has been satisfactorily estimated by the diaphragm method (table II). The largest error here was 12·5% with a mean of 7·5%.

Discussion

The technique described here differs in several particulars from that used by other workers. Variability in the basal glucose uptake has been greatly reduced by allowing the diaphragms, after excision, to remain for fifteen to twenty minutes in ice-cold buffer solution. Krahl (1951) used this manœuvre to reduce the variability of uptake from different pieces of muscle from the same diaphragm. Again, using dry instead of wet weights for the diaphragms is not only more accurate, but also avoids one stage in the important preliminary handling of the diaphragm.

The considerable difference in basal uptake from day to day makes the construction of a bioassay curve impossible. The difficulties have been overcome by using control standards in each experiment. Several factors may affect the day-to-day variation, and it is not profitable at present to speculate on the causes.

Like Groen et al. (1952) we have found a reduced sensitivity to insulin during the hot summer weather when the uptake with 10^{-5} units per ml. was usually not significant. This may be related to some metabolic change in the rats, but we also are unable to explain this feature.

Since undiluted plasma has been used throughout, there is a relatively larger uptake of glucose than would be obtained if the insulin concentration were reduced by dilution; and the value obtained can be related directly to the graph constructed from the control standards, so simplifying and probably increasing the accuracy of the technique.

We are measuring here the *effective* insulin concentration in the plasma, which may be very different from the absolute quantity present. This effective insulin concentration is the over-all effect of several hormones, one of which appears to be glucagon (De Duve 1953). Thus it is not at all surprising that an inhibiting effect is occasionally obtained by this method, but the exact nature of the inhibiting agents has yet to be elucidated.

A direct relationship appears to exist between the insulin level and the corresponding blood-sugar level in the normal fasting subject (fig. 3). This is perhaps not surprising in view of the known action of insulin, and it seems reasonable to expect that these values will be inversely related in the fasting diabetic patient. Again from the above relationship it seems that insulin continues to be secreted throughout even a lengthy fasting period. This is in keeping with the known fact that a minimum absolute quantity of insulin is necessary for normal metabolism.

Our fasting values are similar to, but rather lower than, those obtained by Gellhorn et al. (1941) and Bornstein (1950), who used suitably prepared test animals for the estimation.

There is wide variation in the plasma-insulin values obtained one hour after 50 g. glucose orally. With only 2 exceptions, however, there was a considerable rise over the fasting level, the largest increase being tenfold. The results tended to fall into two distinct groups. In the first, the insulin values were high (600–800 micro-units per ml.) and the sugar levels were still above those in fasting subjects; whereas in the second group the insulin was considerably lower (100–300 micro-units per ml.), and here the sugar levels tended to be the same as or below the fasting values. It seems likely that these groups correspond to the two types of normal individual response to the glucose-tolerance test—the slow and the quick reactions. This variation in response is known to depend on the carbohydrate content of the diet taken before the test.

Summary

The effective insulin concentration in plasma has been estimated by measuring the uptake of glucose by rat hemidiaphragms and comparing the results with those obtained with standard insulin solutions.

The normal fasting levels fell between 40 and 80 micro-units per ml. These values seemed to be directly related to the corresponding blood-sugar levels.

One hour after 50 g. glucose there was a considerable variation in the effective plasma-insulin level with up to tenfold increase over the fasting level. The values appeared to fall broadly into two groups: (1) 600–800 micro-units per ml., and (2) 100–300 micro-units per ml., probably corresponding to the slow and the quick reactions in a glucose-tolerance test.

We wish to thank Prof. John McMichael and Prof. E. J. King for granting us facilities to do this work; and Messrs. Boots Pure Drug Co. Ltd for a supply of five-times recrystallised insulin.

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CLINICAL OUTCOME IN GENERAL PARALYSIS OF THE INSANE AND TABOPARESIS

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A CLOSE and prolonged follow-up of patients with arrested general paralysis of the insane (G.P.I.) and taboparesis raises the question: What factors, if any, over and above the reversibility of the cerebral damage and adequacy of treatment, influence the ultimate clinical outcome? Innumerable reports have been published of the results of treatment in these conditions; but, in the main, no attempt has been made to assess the effect of anything other than the success or failure of the treatment under discussion. The possibility that the clinical outcome might be influenced to some extent by auxiliary factors has long been in our minds. We therefore finally decided to undertake a detailed investigation, and the results of that investigation are described and discussed here.

Material

The material for this study was taken from patients admitted to the Mott Clinic in 1942–46 in whom the diagnosis of either G.P.I. or taboparesis was conclusively established. In this five-year period 536 such patients were admitted, of whom 457 (318 men and 139 women) were general paralytics, and 79 (59 men and 20 women) were taboparetics (table I).

TABLE I—TOTAL NUMBER OF GENERAL PARALYTICS AND TABOPARETICS ADMITTED IN 1942–46

Year	General paralysis			Taboparesis			Total		
	M	F	Total	M	F	Total	M	F	Total
1942	77	37	114	12	1	13	89	38	127
1943	63	29	92	16	5	21	79	34	113
1944	56	24	80	9	6	15	65	30	95
1945	52	26	78	13	4	17	65	30	95
1946	70	23	93	9	4	13	79	27	106
Total	318	139	457	59	20	79	377	159	536

TABLE II—CLINICAL OUTCOME IN 536 GENERAL PARALYTICS AND TABOPARETICS ADMITTED IN 1942–46

Year	General paralytics									Taboparetics								
	Discharged			In hospital			Died			Discharged			In hospital			Died		
	M	F	Total	M	F	Total	M	F	Total	M	F	Total	M	F	Total	M	F	Total
1942	34	19	53	11	9	20	32	9	41	4	0	4	2	0	2	6	1	7
1943	32	15	47	10	8	18	21	6	27	6	5	11	2	0	2	8	0	8
1944	25	14	39	11	3	14	20	7	27	6	4	10	1	0	1	2	2	4
1945	21	13	34	16	5	21	15	8	23	7	0	7	3	1	4	3	3	6
1946	38	6	44	17	9	26	15	8	23	4	1	5	3	0	3	2	3	5
Total	150	67	217	65	34	99	103	38	141	27	10	37	11	1	12	21	9	30

To simplify the issue as far as possible, it was decided to limit the investigation to those patients in whom treatment had apparently been successful in arresting the disease, as shown by a completely negative cerebrospinal fluid (C.S.F.) and the absence of further clinical deterioration, and who were well enough to be discharged to their homes. Of the 536 patients 254 (217 general paralytics and 37 taboparetics) fell into this category. The remainder either died or are permanent hospital inmates (table II).

All the patients about whom we had insufficient information, or who were followed up for less than five years, were excluded from the investigation. These numbered 122. So finally we were left with 132 cases for study (table III).

The patients were aged 17–67, most of them being in the decade 41–50 (table IV).

The duration of the disease before treatment varied from a few weeks to several years. Of the 132 cases 70 had a history of a year or less, 50 of more than a year, and in 12 the time could not be estimated.

TABLE III—ARRESTED AND DISCHARGED GENERAL PARALYTICS AND TABOPARETICS FOLLOWED UP FIVE YEARS OR MORE AND ABOUT WHOM THERE IS ADEQUATE INFORMATION

Year	General paralytics			Taboparetics			Total
	M	F	Total	M	F	Total	
1942	17	7	24	2	0	2	26
1943	12	5	17	2	3	5	22
1944	12	11	23	4	4	8	31
1945	12	10	22	3	0	3	25
1946	24	3	27	1	0	1	28
Total	77	36	113	12	7	19	132

All the patients in this series admitted in 1942–44 were treated by malaria, but a few of those admitted in 1945–46 received penicillin in addition or alone.

Investigation

The patients under investigation were divided into three groups, according to the clinical outcome: recovered, improved, and stationary. Patients were considered to have recovered when no difference was apparent between their condition before and after their illness in the opinion of close relations, friends, and workmates, and in our judgment, and they were able to return to the same or similar work of equal skill and responsibility. Patients were considered to have improved whenever there was a change for the better, however slight, but which fell short of complete recovery. No attempt was made to classify them according to degrees of improvement; consequently they extended from a condition almost indistinguishable from recovery at one end to an all but stationary state at the other. Patients were considered to be stationary when there was no discernible change for better or worse.

The assessment of the ultimate clinico-social outcome was made by us conjointly, using the data collected during the course of the clinic's ordinary regular follow-up of treated patients. This means that no definite plan was worked out as a basis for the investigation but, on the other hand, the patients, their relations, and their social milieu were well known for a considerable time. A detailed and careful study was made of the patient's post-treatment career and of the factors concerned in it.

Results

A preliminary analysis showed that 39 of the 132 patients investigated had made a complete recovery, 81 exhibited various degrees of improvement, 11 were stationary, and 1 could not be classified. Further study led to the appearance of a very striking difference between the time needed for recovery and that required for the attainment of optimal improvement (table V).

Thus, of 39 patients who recovered, 21 did so in a year, 16 in two years, and 2 in three years; in other words, all the recoveries took place within three years. As regards the improvements the position is somewhat different: of 81 patients only 19 attained an optimal condition within three years, whereas 62 (78%) took longer. This seems to indicate a definite and important distinction among those patients who responded to treatment; of those who recovered all but 2 did so within the first two years, whereas the time needed to reach optimal improvement was more or less normally distributed about five years.

A detailed analysis of the three groups of cases—recovered, improved, and stationary—brought to light an interesting difference between them, which appeared to have some bearing on the above-noted time-difference. The patients who recovered did so, apparently, as a direct result of treatment, and no other factor appeared to play any essential part in the outcome. On the other hand, the patients who only improved all showed the influence of auxiliary factors, in addition to adequate treatment, namely:

(1) *A Good Pre-illness Personality.*—A good personality is, of course, as impossible to define adequately as its reverse, a psychopathic one. We regard as component traits the willingness to take responsibility without overrating one's ability; the capacity to persist in unpleasant tasks for a future foreseen benefit; and enough confidence to hold one's own in fairly demanding circumstances, with enough social feeling to give way fairly easily for the benefit of the family or of friends. Such a personality will tend to have established,

TABLE IV—AGE-DISTRIBUTION OF ARRESTED AND DISCHARGED GENERAL PARALYTICS AND TABOPARETICS INVESTIGATED

Year	Age (yr.)				
	10–30	31–40	41–50	51–60	61–70
1942	0	7	8	8	3
1943	2	8	7	4	1
1944	2	6	14	8	1
1945	6	4	12	3	0
1946	0	5	9	12	2
Total	10	30	50	35	7

TABLE V—TIME TAKEN FOR ATTAINMENT OF RECOVERY OR OPTIMAL IMPROVEMENT

Clinical status	Time (yr.)								
	1	2	3	4	5	6	7	8	9
Recovery	21	16	2	..	..	..	..	..	..
Improvement ..	3	10	6	17	15	16	9	3	2

by middle age, a satisfactory pre-illness environment and satisfying social relationships.

(2) *A dependable and sympathetic prop*—usually a close relation, such as spouse or parent.

(3) *Some kind of occupation*, gainful or otherwise, that was within their capacity.

The patients whose condition remained stationary all lacked one or more of these factors, whose distribution is shown in table VI.

Thus 46% of recoveries, 84% of improvements, but no stationaries had all three factors; whereas 45·5% of stationaries were without any of these factors, and none of the recoveries or improvements were found in this group. A more detailed analysis is given in table VII.

A further examination of each factor separately in each group gave the results shown in table VIII.

All this seems to indicate pretty clearly that, in cases which cannot recover, auxiliary factors are of great importance. This is borne out by a study of the case-histories, illustrative examples of which are summarised below. By chance the supporting relation in the examples given is a woman, but cases in which the husband is the prop, retraining the wife in her simplest household duties until she could manage independently, are known to us.

Illustrative Cases

The first case illustrates complete recovery. There were elements of instability in the patient's pre-illness personality, as a result of which he lacked a steady and dependable prop.

TABLE VI—PERCENTAGE DISTRIBUTION OF THREE AUXILIARY FACTORS

Clinical status	Auxiliary factors (%)			
	3 factors present	2 factors present	1 factor present	No factor present
Recovery ..	46	41	13	0
Improvement	84	12·3	3·7	0
Stationary ..	0	18	36·5	45·5

Case 1.—A man, aged 43, admitted on Jan. 5, 1944, and discharged on Aug. 11, 1944.

Pre-illness History and Personality.—He came of respectable working-class stock and lived with his wife and two children in a block of workers' dwellings in a poor neighbourhood. He had been a bus conductor for twenty years and had a good record. He was a heavy drinker and took little interest in his home. For more than eighteen years he had been secretly having an affair with another woman, Mrs. A, who lived in a better district.

History of Present Illness.—For three months before admission he had been unable to sleep and talked incessantly. In November, 1943, he suddenly became confused, hallucinated, and grandiose, and was admitted to a mental hospital, under certificate, eventually being referred here.

Post-illness History and Personality.—On his discharge he went to live openly with Mrs. A and got a job as porter in a block of flats. When seen a year later he appeared to have made an excellent recovery. He remained in portering work but changed his job two or three times, but always to his advantage. Five years after discharge he took a residential post, telling Mrs. A she was to join him as soon as the porter's flat became vacant. At first he returned home two nights a week but later was less regular. Mrs. A subsequently discovered by accident that he was living with another woman as his wife. As a result of Mrs. A's interference he was sacked. However, he soon got another job and has continued well and apparently as satisfied with his third arrangement as with either of the others in their time. There is nothing to suggest that his illness has any bearing on this episode, which appears to be a repetition of an individual pattern.

The next group of cases are arranged in a descending scale of improvement. The first patient has improved so far as to give a superficial impression of normality. He had a fair pre-illness personality, was married to an understanding and intelligent woman, and had been able to return to work within his capacity almost immediately on his discharge from hospital.

Case 2.—A man, aged 49, admitted on Sept. 8, 1944, and discharged on May 18, 1945.

Pre-illness History and Personality.—A well set-up smart-looking married man who had been a costing clerk with the same firm for more than thirty-five years and had a comfortable home, which he rather neglected. He was a "man's man," keen on sport, and inclined to drink heavily. As his contemporaries settled down to more sedentary interests, his friends tended to be of a younger generation, and he had to play the rôle of "free-handed good pal" to retain his popularity.

TABLE VII—ANALYSIS OF FACTORS FOR ALL CASES

Clinical status	Auxiliary factors									
	GP. P. O.	GP. P.	GP. O.	O.	GP.	P.	P.O.	None	Total
Recovery .	18	..	11	5	..	..	5	..	39
Improvement ..	68	1	6	2	..	1	3	..	81
Stationary	..	1	1	..	2	2	..	5	11

History of Present Illness.—In June, 1944, he began to drink more heavily and to be generally more unstable. Shortly before admission he developed grandiose ideas and was finally arrested for attempting to drive away a lorry to "take his pals to a cricket match."

Post-illness History and Personality.—On his discharge he was taken back by his old firm but in a much inferior position. Two years later his wife was delighted with his improvement and continued to assert annually that the day-to-day relationship between them was far happier than it had ever been before his illness. He was still working with the same firm and was, apparently, quite satisfactory, having had two rises, although he had not been promoted to his original responsible position. He had, however, no appreciation of his demotion, saying he had been transferred to a new job because the conditions were healthier and lighter, and he gave a general impression of thinking himself indispensable. Six years after discharge there was a further degree of improvement in that he was not so self-satisfied and appeared to have some insight. He had retained his interest in games and had won a championship cup at bowls. His openhandedness had been replaced by a carefulness his wife regarded as "stingy." His wife now had a better understanding of his condition and appreciated his childishness, dependence, and irritability. She was able, however, to impose her own judgment in essentials and to give way in minor matters in a useful way without developing contempt for him.

The next patient had a fair pre-illness personality and a sympathetic dependable wife, and the clinical condition was much influenced by his employment situation.

Case 3.—A man, aged 32, admitted on Aug. 25, 1942, and discharged on Nov. 18, 1942.

Pre-illness History and Personality.—A quiet, reserved, timid man, who lived with his wife and son in a large block

TABLE VIII—NUMBER OF CASES IN EACH GROUP HAVING AUXILIARY FACTORS SHOWN SEPARATELY

Clinical status	Good personality	Prop	Occupation	No. of cases
Recovery	29	23	39	39
Improved ..	75	73	79	81
Stationary ..	4	3	1	11

of workmen's dwellings in a poor district. He had had an unhappy childhood and appeared to regard his wife as a protector. Before the war of 1939–45 he had been a pastry-cook and baker's roundsman; during the war he was an air-raid warden and later joined the National Fire Service.

History of Present Illness.—For three years he had been noticeably slower and duller, and for a year had had headaches associated with vomiting. In June, 1942, he was admitted to hospital for investigation.

Post-illness History and Personality.—When he first went home he was depressed, hallucinated, and solitary, and worried over being unemployed. He had been recommended for light work by his doctor, but there was none available in his district, and he eventually took a heavy factory job on his own initiative. His improvement is said to date from this. For the next four years he had a series of short-term jobs and was recognised by his wife as practically unemployable, because of slowness and lack of initiative, except at a time of full employment. In 1947 he started work as a liftman, where the pace required was within his capacity, and he remained there for three years. In 1950 he returned to bakery work but to a completely routine repetitive job with no responsibility, taking loaves off a chute and stacking them. He likes the familiar environment of the bakery and does not appreciate his demotion. He remains conspicuously slow and simple, but his wife shelters and encourages him, always emphasising his improvement and (perhaps unconsciously) adapting herself to his deterioration by accepting more responsibility and always being prepared for his dismissal.

The next three cases have two things in common. The patients are all so severely deteriorated as to be unable to be gainfully employed. The first is a congenital general paralytic of good pre-illness personality who is utterly dependent on the support and protection of her parents. As a result of patient, persistent, and understanding training she has been enabled to do simple routine jobs about the house and garden and to take her place in local community life.

Case 4.—A woman, aged 28, admitted on Dec. 19, 1944, and discharged on Feb. 15, 1945.

Pre-illness History and Personality.—She was an only child, who had been brought up in comfortable circumstances and had won a scholarship to a grammar school. On leaving school she went as a saleswoman to a West End gown shop and later helped her mother in her wool shop.

History of Present Illness.—In 1939 she learnt typing but could never reach a reasonable speed, and at about the same time she had a "turn," in which one arm went numb. In 1940 she joined the W.A.A.F. but was constantly moved around, and the impression was gained that she was incompetent and a misfit. She was finally discharged on medical grounds in 1942. She then remained at home, emotionally unstable, lacking in initiative, and gradually deteriorating. After a fruitless course of psychotherapy she was admitted to hospital for further investigation, and the diagnosis was established.

Post-illness History and Personality.—On discharge she was so childish and distractable that life outside the care and protection of her home (or an institution) was obviously impossible. Three years later she was more amenable and able and willing to do simple things in the house and garden but needed constant supervision to avoid a trail of half-done jobs. She was neglectful of her person and had to be told to wash, change, and keep herself tidy. She was childishly garrulous and talked to strangers unreservedly. She was unduly sensitive and reacted to any criticism or correction with tears. A year later she gave a more normal impression. She was learning to follow a routine over her household tasks, but her mother appreciated that this was due to persistent training and not any real basic improvement. Six years after discharge she had learnt to do really useful work in the house and garden. Under her mother's guidance she was an active and enthusiastic member of the women's institute and was able to hold her own at the old-time dancing classes, thanks to careful and thorough coaching during the week. Her parents systematically discouraged her excessive chattering, but if she met anyone who would listen she "went ahead with the brakes off."

The next patient, who was of good pre-illness personality, is unusual in that the necessary support was provided not by close relations or friends but by a succession of kindly and sympathetic neighbours. She was, with their help, enabled to lead a more or less independent life, doing her own domestic chores and shopping.

Case 5.—A woman, aged 62, admitted on Nov. 18, 1942, and discharged on Feb. 5, 1943.

Pre-illness History and Personality.—A short, stout, uneducated woman, who had lived for many years in a room in a cul-de-sac, a small crowded backwater where everybody knew everybody else. She did regular daily domestic work, and was regarded as a genuine good sort and had won the respect and friendship of "the street."

History of Present Illness.—In November, 1940, she went to hospital complaining of curious feelings down her body, and attended irregularly for the next two years. In May, 1941, she had to give up work and in November, 1942, she had a severe seizure and was admitted to hospital.

Post-illness History and Personality.—While she was in hospital, the street good samaritan had her room cleaned and things washed and, when she first went home, had her in for all her meals. This arrangement came to an abrupt end owing to the patient's persistent pilfering. Her hostess had known about this but had always contrived to call in and get the things back before they were missed, until one day the patient was caught red-handed. However, the kindly neighbour continued to help and took in a dinner every Sunday until the patient rewarded her by opening her window and shouting to her to return her ear-rings. For a time another neighbour stepped into the breach, only to endure the same sequence of robbery and counter-accusations. At first the patient tended to get lost when she went out, and would walk miles before asking a policeman for help, explaining, "I had all day and I knew I'd forget what he told me," but eventually she had to be escorted home. Three years after discharge she gave a much better impression and was considered greatly improved by her supervising neighbours. She had got into regular habits and could manage her own shopping, cooking, and cleaning, and could find her way about quite well. Three years later she had improved still further and, although silly and simple, had gradually come to live a more or less independent, though limited, life.

The last patient in this group of three shows gross residual deterioration. His pre-illness personality was fair. He is interesting because his clinical condition remained stationary until circumstances enabled his wife to give him adequate support and training, when he made a perceptible, though only slight, improvement and became able to do simple but useful jobs about the house.

Case 6.—A man, aged 55, admitted on Oct. 13, 1942, and discharged on March 21, 1943.

Pre-illness History and Personality.—A sturdy little man who lived with his wife and his mother-in-law. He was a good husband and well liked by his neighbours and workmates. He had been a regular soldier and since his discharge had had a number of unskilled jobs with a fair amount of unemployment.

History of Present Illness.—In November, 1938, he had an apoplectiform attack following the removal of a lipoma. His blood Wassermann reaction was positive, and he attended for treatment until August, 1941, when he defaulted. He slowly deteriorated and in March, 1942, was obliged to give up work. In September, 1942, he had another seizure and was admitted to hospital.

Post-illness History and Personality.—His unemployability was obvious. His wife, obstinately rejecting relief, persisted in full-time work, though herself in poor health. He was so slow and silly as to be worse than useless in the house, and his wife had no time to help him to relearn gradually how to do things. His 80-year-old mother-in-law was afraid of him and too irritated by his silliness to humour him. The weakness of each aggravated that of the others, until the wife was faced with the possibility of her own admission to hospital and the consequent permanent break-up of the home. She accepted timely relief, stayed at home, and established a satisfactory domestic routine and a more relaxed atmosphere. With simple

retraining by example, patience, and encouragement the patient learnt to do a few simple things reliably. His mother-in-law became less afraid and resentful, and gradually adopted her daughter's way of using his increased suggestibility to make for easier living all round. His wife was eventually able to do part-time work (appreciating that the outside interest relieved tension). Although he remained silly, childish, euphoric, and often irritable he could now do his simple jobs without supervision. Seven years after discharge the domestic situation appeared fairly stable. He was still childish, dependent, irritable, and very suggestible, but remained able to do a few odd jobs about the house. The old mother-in-law had learnt to treat him with patience and even affection. The impression gained was of a simple but harmonious trio.

The clinical condition of case 7 has remained stationary. He is not so grossly deteriorated as cases 4–6 but has not shown the slightest improvement. He had a poor pre-illness personality and is unhappily married, his wife just tolerating his presence but making no attempt to support and encourage him. He is practically unemployable, only working because the business is a family concern.

Case 7.—A man, aged 44, admitted on Oct. 16, 1944, and discharged on Dec. 23 1944.

Pre-illness History and Personality.—A thick-set aggressive-looking man who comes of a family of market stall-holders. He is married to a good-looking, sturdy, self-reliant woman and has two sons. He owned a fruit stall and lived with his family in a small comfortably furnished house near the market. He had been suspicious, violent, and odd ever since marriage, and is known to have been unfaithful to his wife.

History of Present Illness.—His personality, always poor, gradually deteriorated; he became pathologically jealous of his wife, accused her of infidelity, and called her by obscene names. A few months before admission he began to lose weight and became abnormally restless. He was finally taken to hospital and then referred to us.

Post-illness History and Personality.—After treatment he discharged himself against advice and a week later was arrested for stealing empty milk bottles. He was remanded for a medical report and certified. His wife was made official receiver and kept the business going. He was eventually considered fit for trial and was sent to an aftercare home because his wife refused to have him. He absconded and was discharged by operation of the law. He then returned home, where he has remained an unwanted intruder ever since, being treated like a pariah and not allowed anywhere but his own bedroom, where he has occasionally smuggled in a prostitute. One meal a day is cooked for him, and he is allowed to help on the stall at busy times. His wife is still his official receiver, and he is never allowed any share in running the business. He has occasionally been seen in the market by one of us. He has queer jerky movements and mutters to himself from time to time, but seems to serve the customers satisfactorily. He would not be tolerated for a moment in any better-class milieu, but in a busy market with cheap jacks, contortionists, and professional eccentrics he passes relatively unnoticed. Five years after discharge his condition is unchanged.

Discussion

SUBJECTIVE EVALUATION

The data upon which this paper is based were collected in the course of the ordinary regular work of the clinic and are the result of direct knowledge of the patients and their environments: as inpatients and their visitors, as outpatients and their escorts, in their homes and, in some cases, at their work, extending over a period of from five to ten years. Does this long, continuous, and varied contact in both war and post-war conditions offset the disadvantage of a purely subjective judgment, incapable of objective verification? We feel that it does, at any rate sufficiently to allow some conclusions to be drawn from it.

AFTERCARE

In all the cases in this series aftercare, an integral part of the clinic service, played an important part, but its scope was too wide and too indefinite for it to be pinpointed in this skeletal review. The orientation was always towards the prevention of urgent social problems, many of which (interpersonal or financial) simply did not arise because of timely information, explanation, or action. Preventive social work, like preventive medicine, is often less impressive than dealing with crises and always difficult to prove, but it is more economical of the community's resources and far less disabling to the people concerned.

RECOVERY *v.* IMPROVEMENT

The basic outcome of clinically successful treatment in G.P.I. and taboparesis is the permanent arrest of the disease process and, in most cases, a greater or lesser return to the pre-illness condition. Whether complete recovery or something short of it takes place depends on the institution of treatment before any irreversible cerebral damage has taken place. No attempt has been made in this paper to discuss this aspect of the problem. It is obvious from a common-sense point of view that the earlier treatment is begun the better will be the clinical result.

The starting-point of this investigation was the possibility that the ultimate clinical outcome might be influenced to some extent by auxiliary factors in addition to the above-mentioned fundamental ones. An analysis of our material seemed to indicate that no additional factors were necessary in bringing about full clinical recovery. As regards the patients only capable of improvement, their ultimate condition appeared to be very greatly influenced by the presence of certain extraneous factors having no direct connection with the illness: a good pre-illness personality; a satisfactory prop; and some kind of occupation within their capacity. These function, apparently, by providing facilities for stimulating and re-educating the damaged nervous system in a personality able to profit by them. If this is so, it would explain the striking difference in the time required for recovery or optimal improvement shown by our cases, since these processes are very time-consuming.

Summary and Conclusions

An investigation was undertaken into the possibility that the ultimate clinical outcome in general paralysis and taboparesis might be influenced by auxiliary factors not connected directly with the disease and its treatment.

To simplify the issue as far as possible, the investigation was limited to cases in which the disease was arrested, as shown by the presence of a negative cerebrospinal fluid and the absence of further clinical deterioration, and the patients were well enough to leave hospital.

132 patients—113 general paralytics and 19 taboparetics—fell into this category.

They were divided into three groups according to the ultimate clinical outcome: recovered, improved, and stationary.

Of the 132 patients 39 made a complete recovery, 81 showed various degrees of improvement, 11 remained stationary, and 1 could not be classified.

A very striking difference was found between the time needed for recovery and that required for optimal improvement; of those who recovered, all but 2 did so within the first two years, whereas the time needed to attain optimal improvement was more or less normally distributed about five years.

Patients who recovered did so as the direct result of treatment, no other factor, apparently, being necessary. Patients who only improved all exhibited the presence of auxiliary factors: a good pre-illness personality; a dependable and sympathetic prop; and some kind of occupation within their capacity. Patients whose condition remained stationary all lacked one or more of these factors.

We wish to thank Dr. J. H. Watkin and Dr. W. D. Nicol for their interest and support.

SYMPATHECTOMY FOR ATHEROSCLEROSIS

PRELIMINARY HEATING TEST

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ATHEROSCLEROSIS is the commonest disease causing vascular occlusion in the lower limb in patients aged more than 35, and often these patients seek medical advice because of pain in the calf on exercise. It is known that this pain is due to a deficient blood-supply to the calf muscles, and it has become common practice to do a lumbar sympathectomy in these patients in an attempt to improve the blood-supply to the limb and so to the muscles.

There is no doubt that some patients benefit from operation in that afterwards they can walk for greater distances before the onset of intermittent claudication. The problem is how to select those patients likely to benefit from sympathectomy.

At present the selection is done partly by clinical examination and partly by such tests as the heating test. Warmth applied to one part of the body causes vasodilatation in other parts remote from the point of application (Gibbon and Landis 1932). In normal people this vasodilatation, which is due to release of sympathetic vasoconstrictor tone, affects the skin vessels to increase the skin-temperature, and also leads to an increase in the resting muscle blood-flow (Barcroft et al. 1943). The heating test measures skin-temperature changes, and these are taken as an indication of the degree of vasodilatation which can take place in the limb under investigation. It is not clear whether in the presence of peripheral vascular disease this vasodilatation of skin vessels (determined by skin-temperature changes) can be taken as an indication of the effects that will follow sympathectomy.

We therefore decided to assess the clinical value of the heating test in a consecutive series of patients complaining of intermittent claudication subsequently treated by sympathectomy.

Material

To make this inquiry as precise as possible the only patients included are those with atherosclerosis in whom the presenting symptom was intermittent claudication. Patients with gangrene of the foot or toes secondary to atherosclerosis, or with other forms of peripheral vascular disease—e.g., thrombo-angiitis obliterans—are not included. Also not included are those patients aged less than 45 whose condition was not typical of atherosclerosis or of thrombo-angiitis obliterans, but who form a third group of obliterative arterial conditions which is not easily classified.

The series therefore consists of 28 patients, in 6 of whom the operation was bilateral. For the purpose of this analysis each limb will be considered separately, bringing the total number to 34. A heating test was done on each of the patients before sympathectomy. The value of the operation was assessed by its effect on the complaint of claudication, when the patient was seen a year later. The youngest patient was aged 46 and the oldest 64.

Methods

The heating test is done in a special room thermostatically controlled at 20°C. The patient lies on a couch and wears light pyjamas. Attached to each great toe and each index finger is a thermocouple. The thermocouples are made from 40 s.w.g. copper and 'Constantan' wire, and are applied to the digit in the form of a loop whose size can be varied with a rubber "slider," so that the actual junction can be held closely in apposition to the skin. The wires lead to a Post-Office resistance box and moving-coil mirror galvanometer. The temperature is read on a scale, the apparatus being calibrated to read directly changes of 0·5°C. Cold junction temperatures are measured with a standardised thermometer (N.P.L. certificate).

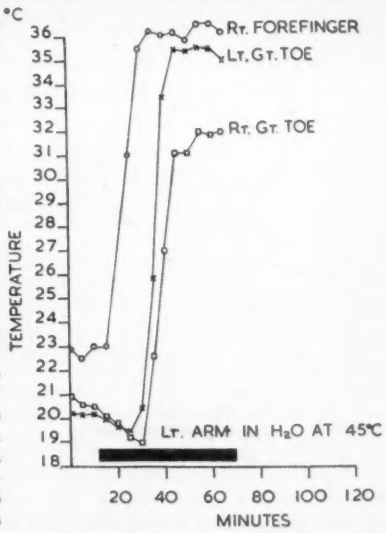

Fig. 1—A normal response to a heating test.

The limbs are allowed to cool until their temperature has come into equilibrium with that of the room, indicated by steady skin-temperature readings. The time taken for this to happen is three-quarters of an hour. One hand and forearm are then immersed in a bath filled with water at 45°C. The arm bath is changed every 10 minutes so that the temperature of the stimulus is maintained.

The temperatures of the other three limbs are recorded every 5 minutes until the temperature does not rise further, usually 45–60 minutes. The temperature records are plotted on graph paper.

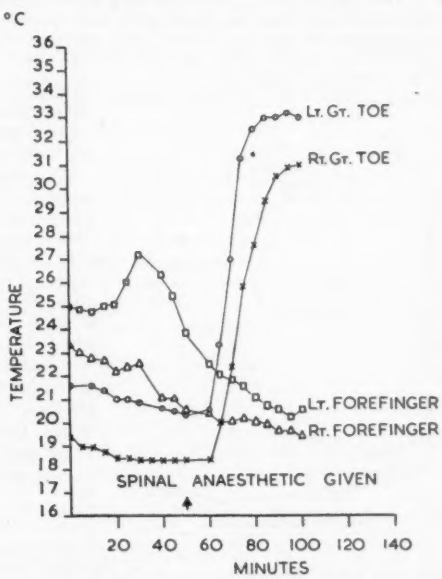

Fig. 2—A good heating-test response in both lower limbs following spinal anæsthesia in a patient in whom there was a poor response to a reflex vasodilatation test (same patient as in fig. 5).

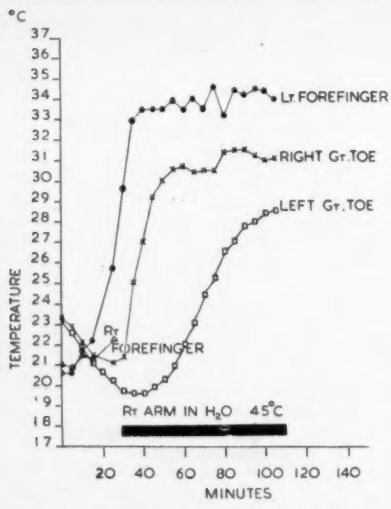

Fig. 3—A good response in both lower limbs to a heating test.

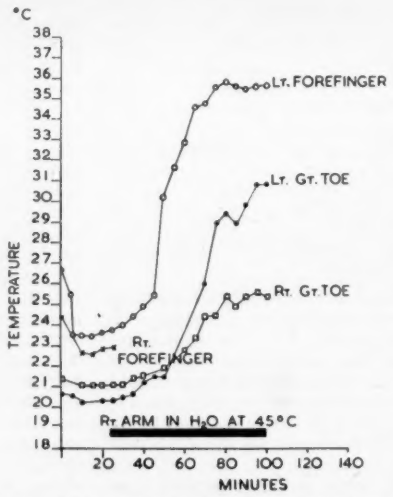

Fig. 4—A fair response in the right lower limb to a heating test.

In some instances in which the heating test showed a poor response a spinal anæsthetic was given, and skin-temperatures were recorded. Anæsthesia to the level of T10 should be a potent way of blocking the sympathetic outflow to the legs. This is substantiated by the fact that several patients who showed a poor response to the reflex vasodilatation test responded to spinal anæsthesia with good vasodilatation.

In all the patients lumbar sympathectomy was done through a loin incision and retroperitoneal approach, the second and third lumbar ganglia with the intervening sympathetic chain being removed.

Results

The response to the heating test is graded as good, fair, or poor (figs. 1–5):

A good response is one in which there is a rise of 5°C or more in the skin-temperature of the limb without delay in starting and without delay in reaching the maximum.

A fair response is one in which the skin-temperature rises more than 1°C but less than 5°C. This rise is often long delayed and slow to reach its maximum.

A poor response is one in which there is less than 1°C rise of temperature, no rise at all, or an actual fall.

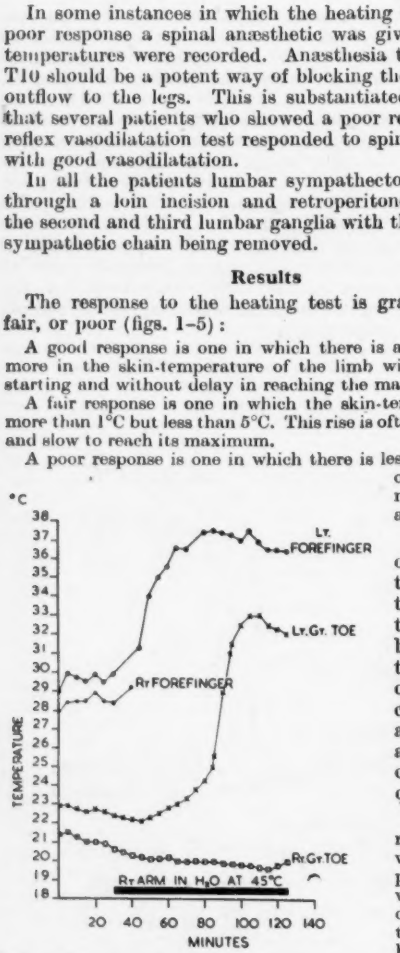

Fig. 5—A poor response in the right lower limb to a heating test (same patient as in fig. 2).

The result of operation for the purpose of this investigation is judged by its effect on the complaint of intermittent claudication and is classified as "improved" or "in statu quo" (I.S.Q.):

An improved result is one where the patient can walk at least double the distance before he experiences pain in the limb.

An I.S.Q. result is where there is little change in the distance the patient can walk before he experiences pain in the limb.

The clinical results are summarised in table I. The results of the preoperative heating test related to the effect of sympathectomy on claudication are set out in table II. It will be seen that of the 21 patients giving a good heating-test response before operation 10 were improved by sympathectomy and 11 obtained no benefit. Of 5 patients showing a fair response only 1 was improved; and of 8 patients giving a poor response to heating 2 were benefited.

6 patients underwent spinal anæsthesia preoperatively. In 4 of the 6 the anæsthesia led to a good rise of temperature in the skin of the leg, but only 2 of the 4 patients were improved by sympathectomy. 1 patient showing a fair rise was not improved by operation, but the patient showing a poor response to spinal anæsthesia was improved by sympathectomy (table III).

Discussion

The figures at first sight suggest that, if the heating-test response is good, there is a better chance of a favourable result from sympathectomy than if the response is

TABLE I—RESULTS OF OPERATIONS ON CLAUDICATING DISTANCE IN 34 LIMBS

Limb no.	Distance able to walk without pain before operation (yd.)	Distance able to walk without pain following operation (yd.)	Clinical result
1	50–80	200	Improved
2	50	50. Patient cannot say definitely, because his other leg troubles him now	I.S.Q.
3	200	200	I.S.Q.
4	880	1760	Improved
5	100–200	200	I.S.Q.
6	200–300	200–300	I.S.Q.
7	200	Any distance	Improved
8	200	Any distance	Improved
9	100	300	Improved
10	20	400	Improved
11	50–100	300–400	Improved
12	880	880	I.S.Q.
13	100–150	150	I.S.Q.
14	440	1760	Improved
15	100	100	I.S.Q.
16	100	100	I.S.Q.
17	100–150	880	Improved
18	200	Any distance on flat ground; some pain up hills	Improved
19	440	440	I.S.Q.
20	75	75	I.S.Q.
21	200–300	200–300	I.S.Q.
22	25	25	I.S.Q.
23	25	Much improved, ? distance	Improved
24	75	75	I.S.Q.
25	100	100	I.S.Q.
26	400	3520	Improved
27	200	200	I.S.Q.
28	Unknown	No improvement	I.S.Q.
29	200	200	I.S.Q.
30	150–200	200	I.S.Q.
31	500	Any distance	Improved
32	400	400	I.S.Q.
33	150	150	I.S.Q.
34	200	200	I.S.Q.

fair or poor, but this suggestion is not supported by statistical analysis, and the result is no more than could happen by chance about once in 10 trials (Fisher's (1946) exact test $P > 0.1$). Moreover poor heating-test responses are followed in some cases by improvement after sympathectomy, and good responses are often followed by no improvement. Hence in no case can a confident prognosis be given on the result of the heating test. Similar conclusions apply to the value of spinal anæsthesia in the short series tested. This is not surprising when it is remembered that Barcroft and Swan (1953) have shown that, although sympathectomy will improve the blood-flow in muscles at rest, it does not apparently have any effect on the circulatory changes taking place during or after musculature activity. In fact it is difficult to see why any patient should be improved at all in respect of his claudication unless by spontaneous remission of the disease.

TABLE II—RELATIONSHIP BETWEEN HEATING-TEST RESPONSE AND RESULT OF OPERATION

Preoperative heating-test response	No.	Improved	I.S.Q.
Good	21	10	11
Fair	5	1	4
Poor	8	2	6
Total ..	34	13	21

Two of the observations in this series are of interest. Most of the patients, whether improved in their complaint of intermittent claudication or not, were well pleased with the result of sympathectomy, for it gave them a persistently warm foot of good colour and nutrition. Pregangrenous changes in the toes healed and remained so for the year or more of observation following the operation.

Another improvement was in rest pain. In 11 of the 28 patients there was pain at rest, usually in the foot, and this often caused the patient much distress at night. Of these 11 patients 9 were cured or improved of their rest pain.

TABLE III—RELATIONSHIP BETWEEN RESPONSE TO SPINAL ANÆSTHESIA AND RESULT OF OPERATION

Preoperative spinal anæsthesia	No.	Improved	I.S.Q.
Good	4	2	2
Fair	1	..	1
Poor	1	1	..

Although it is impossible to relate the results of a preoperative heating test to the clinical effects obtained by sympathectomy in these patients with atherosclerosis causing claudication, it is of interest to confirm the continuing value of the operation in most of the patients examined more than a year after sympathectomy.

Summary

The heating-test response was measured in 34 atherosclerotic limbs in which the presenting symptom was intermittent claudication, and the response was compared with the result of lumbar sympathectomy, judged by relief of claudication.

There is no evidence to suggest that the heating test is of prognostic value in forecasting the outcome of lumbar sympathectomy for patients with intermittent claudication due to atherosclerosis.

Although lumbar sympathectomy improved the complaint of claudication in less than half of the patients in this series, it produced in all the patients a warm dry foot, and relieved most of the patients who had rest pain.

We wish to thank Prof. F. H. Bentley for his stimulating interest in this investigation and for his advice and criticism.

References at foot of next column

CORTISONE IN PNEUMOCONIOSIS WITH AND WITHOUT REVERSIBLE BRONCHOCONSTRICTION

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ENCOURAGING results have been obtained with cortisone in bronchial asthma (Arbesman et al. 1952) and occasionally in certain chronic lung conditions. Baldwin and De Gara (1952) found that satisfactory symptomatic relief was the general rule when 11 patients with intractable asthma were treated in hospital with a daily dose of 100 mg. of cortisone. Similar results were obtained by Franklin et al. (1952), who found that maximum symptomatic improvement took place eight to fourteen days after starting oral cortisone. Coste et al. (1951) report that corticotrophin and cortisone diminish the cellular elements of granulomatous tissue, and it is probably for this reason that cortisone has been found effective in the treatment of some cases of berylliosis (Robbins and Lyons 1953) and pulmonary sarcoidosis (McClement et al. 1953). In opposition to these beneficial effects cortisone lessens the body defences against tuberculosis in animals (Hart and Rees 1950). Fearnley and Bunim (1951) suggest that it may specifically lower the erythrocyte-sedimentation rate (E.S.R.) by altering the plasma-fibrinogen level.

This report describes the effect of oral cortisone in chronic lung disease associated with various degrees of reversible bronchoconstriction. The purposes of the investigation were to measure:

(1) The effect of cortisone on the maximum ventilatory capacity of patients with reversible bronchoconstriction.

(2) To observe whether any radiological change occurred in patients with pneumoconiosis as a result of cortisone therapy.

(3) To observe whether the E.S.R. was affected by treatment with cortisone.

The Investigation

The maximum ventilatory capacity was assessed by the expiratory flow-rate test (E.F.R.^{40}), where the volume of air expelled in 0·75 sec. is measured (Kennedy 1953). The degree of reversible bronchoconstriction was assessed by measuring the E.F.R.^{40} before and after inhalation of 1/1000 adrenaline (Kennedy and Stock 1952). The E.S.R. was measured after one hour by the Westergren method.

Procedure and Treatment

Before treatment with cortisone all the patients were observed for two weeks, during which the following investigations were made on each of them: (1) three assessments of the E.F.R.^{40}, each the mean of six tracings before and after adrenaline; (2) an E.S.R. estimation; (3) a postero-anterior chest radiograph; and (4) clinical examination and measurement of the blood-pressure.

Cortisone was administered by mouth, a daily dose of 100 mg. of 'Cortone Acetate' (Merck) being given for fourteen days. During this treatment three separate estimations of the E.F.R.^{40} were made each week before and after an inhalation of adrenaline. Every second day the patients were examined for side-effects and the blood-pressure was recorded.

This routine was continued for two weeks after the cessation of treatment, but some readings were unavoid-

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TABLE I—DETAILS OF PATIENTS

Case no.	Age (yr.)	Trade	Diagnosis	Rhonchi	E.S.R. (mm. in 1 hr.)	Blood-pressure (mm.Hg)	E.F.R.40 values (litres per min.)*		
							Before adrenaline	After adrenaline	Change %
1	66	Coalminer	Simple pneumoconiosis and asthma	+	12	170/90	34	43	+ 26·4
2	40	Schoolmaster	Asthma	+	10	140/100	23	37	+ 60·8
3	48	Coalminer	Complicated pneumoconiosis and bronchospasm	+	16	110/80	34	44	+ 29·4
4	60	Coalminer	Chronic bronchitis and emphysema	+	10	160/100	46	55	+ 19·5
5	56	Potter	Simple pneumoconiosis and bronchospasm	+	10	120/70 †	30	33	+ 10·0
6	61	Coalminer	Simple pneumoconiosis and emphysema	−	8	140/100	21·5	24	+ 11·6
7	66	Coalminer	Simple pneumoconiosis and hypertension	±	10	190/100	67	67	Nil
8	63	Potter	Simple pneumoconiosis	±	8	120/90	38	40	+ 5·2
9	68	Coalminer	Simple pneumoconiosis	−	14	160/90	30	34	+ 13·3
10	63	Coalminer	Lung fibrosis, ? origin	−	10	120/90	25	26	+ 4·0
11	63	Potter	Complicated pneumoconiosis and bronchitis	+	11	100/80	55	60	+ 9·1
12	63	Coalminer	Simple pneumoconiosis and hypertension	−	16	180/100	78	77	− 1·3

+ rhonchi invariably present. ± rhonchi occasionally present. − no rhonchi.
* These values are the mean of three assessments taken during the fortnight before treatment with cortisone.
† Developed œdema.

ably missed owing to the Whitsun Bank Holiday. A final postero-anterior chest radiograph was taken a month after the cessation of cortisone therapy. The E.S.R. and weight of all the patients were measured weekly during treatment and during the subsequent fortnight of observation.

Material

12 male patients with chronic lung disease were selected for this investigation. All were outpatients attending a silicosis treatment centre and had been observed for one to five years. Their sputum had been repeatedly examined for tubercle bacilli and was negative in all cases. Of the 12 patients 10 had radiological evidence of pneumoconiosis, and of the 2 remaining patients one had had asthma for twenty-one years and the other had chronic bronchitis and emphysema. Table I gives the clinical diagnosis, E.S.R., blood-pressure, and response to adrenaline in the 12 cases. 7 patients were considered to have reversible bronchoconstriction because their E.F.R.40 was raised 10% or more after the adrenaline inhalation and the other 5 gave little or no response to aerosol adrenaline. 2 patients had simple hypertension in addition to their chronic lung condition.

Results

All except 1 of the 12 patients completed the two weeks' treatment. The mild euphoria commonly seen in patients receiving cortisone was evident in most of them. 8 thought their breathing was easier, but this subjective finding was not substantiated by a mean increase of the E.F.R.40 values.

The mean E.F.R.40 for all the patients (table II) before, during, and after treatment was 40·2, 39·75, and 40·3 litres per min. respectively. Cases 2 and 8 alone showed an increase (and this was 6 litres per min. or less) while on cortisone; but their values on cortisone were no higher than values recorded earlier in the year while on no treatment. The mean E.F.R.40 values, after adrenaline, before and during treatment with cortisone for the 12 patients were 45 and 45·75 litres per min. respectively. Thus there is no evidence that cortisone enhances the adrenaline effect.

None of the 10 patients with pneumoconiosis showed any radiological change after treatment with cortisone.

The E.S.R. showed very little change either during treatment or afterwards. The mean E.S.R. of the 11 patients who completed their course of treatment were as follows: before treatment 11·3 mm., during treatment 10·2 mm., and after treatment 10·2 mm. in one hour. In 4 patients the E.S.R. did not change. In 2 patients the E.S.R. increased by 2 mm. In the 5 remaining patients the E.S.R. was lowered by 6 mm. in 1 man, 4 mm. in 1 man, 3 mm. in 2 men, and 1 mm. in 1 man.

Side-effects were observed in only 1 patient, who developed pitting œdema at the start of his second week of treatment, when cortisone was withdrawn. This fluid retention was associated with a raised blood-pressure (120/70→150/90 mm. Hg) and took about five days to return to normal. No increase in either the blood-pressure or the body-weight was observed in the other patients during treatment with cortisone.

Discussion

Although 8 of the 12 patients claimed subjective improvement in their breathing, none of the 12 showed any improvement in their maximum ventilatory capacity;

TABLE II—EFFECT OF CORTISONE ON E.F.R.40

Case no.	Before treatment			During treatment with oral cortisone			After treatment			Change from mean before to mean during treatment (litres per min.)
	No. of readings	E.F.R.40 (litres per min.)		No. of readings	E.F.R.40 (litres per min.)		No. of readings	E.F.R.40 (litres per min.)		
		Mean	Range		Mean	Range		Mean	Range	
1	3	34	33–35	6	33	31–34	4	37	33–39	−1
2	3	23	16–27	6	28	20–33	2	23	17–29	+5
3	3	34	32–37	5	33	32–36	4	36	32–38	−1
4	3	46	38–52	6	46	43–49	3	50	50–52	0
5	3	30	29–32	4	28	25–32	—	(30)	—	−2
6	2	21	20–23	6	21	19–23	3	21	19–22	0
7	3	68	64–72	6	68	65–72	2	71	70–72	0
8	3	38	37–38	5	44	42–46	1	36	—	+6
9	3	30	30–31	6	29	26–33	3	29	28–31	−1
10	3	25	22–27	5	22	20–23	3	23	22–24	−3
11	3	55	54–56	5	48	46–52	3	50	47–51	−7
12	3	78	72–83	4	77	71–83	—	(78)	—	−1
Total	35	482		64	477		28	(484)		−5
Mean		40·2			39·75			(40·3)		−0·4

In 2 patients no readings were obtained after treatment; hence pre-treatment values for these 2 patients have been inserted in parentheses.

nor was their response to an inhalation of adrenaline enhanced as a result of cortisone therapy. Thus the symptomatic improvement in these patients agrees with that reported by other workers in bronchial asthma treated with cortisone. However, physiological tests do not reveal any improvement of lung function in patients treated with cortisone, and the improvement may be merely subjective and due to the euphoria commonly observed in patients receiving cortisone. On the other hand, the selection of patients in this and other series may be very different. The present series consisted of elderly men mainly with chronic lung disease associated with reversible bronchoconstriction which can in no way be described as an allergic asthma, because none of the patients, including cases 1 and 2, showed wide day-to-day fluctuations; the fluctuations observed were nearly always associated with respiratory infections. The factor common to the two conditions is that adrenaline given either by inhalation or by injection relieves both, though its mechanism may differ in the two conditions, as it is suggested that adrenaline may act on either the mucosa or the smooth muscle of the bronchi, causing bronchiolar dilatation, or on the pulmonary vessels, causing vasoconstriction (Sheldon and Otis 1951). In the present series aerosol adrenaline produced an improvement of 10% or more in the E.F.R.[40] in 7 of the 12 patients.

Kurland and Freedberg (1951) report that cortisone potentiates the pressor action of intravenous *l*-noradrenaline. This investigation does not suggest that cortisone potentiates the bronchodilatory action of aerosol adrenaline. In Canada corticotrophin is reported by Kennedy et al. (1951) to have produced subjective improvement in a patient with acute silicosis, but there was no radiological change. It is difficult to imagine how either corticotrophin or cortisone could influence the dust nodule of pneumoconiosis or the fibrous nodule of silicosis. Curran (1952) has shown that in mice the mature silicotic nodule is not affected by cortisone, while Margarey and Gough (1952) found that cortisone inhibited the fibrosis of quartz in the mouse, depressed it in the rat, and had no effect in the guineapig. Harrison et al. (1952) found that the development of experimental silicosis in rats was modified, both in amount and distribution, by cortisone.

In the present investigation cortisone did not change the radiological picture of patients with coalworkers' or pottery-workers' pneumoconiosis; nor did it improve their maximal ventilatory capacity. This finding is not at variance with those of workers reporting physiological improvement in berylliosis or in pulmonary sarcoidosis, since the pathology of these conditions and that of pneumoconiosis are quite different.

Pneumoconiosis with massive fibrosis (complicated pneumoconiosis) is thought to be a form of pulmonary tuberculosis modified by dust (Fletcher and Gough 1950), and the evidence of Hart and Rees (1950) and other workers suggests that cortisone may have a harmful effect on tuberculous lesions. In this investigation special precautions were taken to exclude any patient with overt pulmonary tuberculosis. If there was a latent tuberculous focus in any of the patients in this investigation, there was no evidence from the follow-up studies of the sputum, radiographs, and E.S.R. that this focus was activated by cortisone.

In this series there was a slight mean fall in the E.S.R. at the end of treatment, but this can be explained by the fact that 3 of the 5 patients who showed a fall had, just before their cortisone treatment, E.S.R. values higher than their mean E.S.R. over the previous year. The E.S.R. remained low two weeks after the cessation of cortisone therapy, which suggests that the small drop in this series was not due to any specific lowering effects of cortisone.

Summary

12 patients with chronic lung disease, 10 of whom had pneumoconiosis, associated with variable degrees of bronchoconstriction, responding to adrenaline, were treated for fourteen days with cortisone 100 mg. daily.

Neither during nor after treatment with cortisone was there any general improvement in an objective test of the maximum ventilatory capacity, though 8 of the 12 patients thought their breathing was better. Treatment did not effect any change in the chest radiographs.

The objective tests were improved after treatment with aerosol adrenaline. This effect of adrenaline was not enhanced by cortisone therapy.

There was a slight mean fall in the E.S.R. (one hour Westergren) at the end of treatment, but this was not considered significant.

These findings do not suggest that cortisone has a place in the routine treatment of reversible bronchoconstriction associated with pneumoconiosis of coal-workers or of pottery-workers.

Although complicated pneumoconiosis is thought to be a modified form of tuberculosis, no deleterious effects from cortisone therapy were observed.

I am indebted to Dr. J. C. Gilson, director, pneumoconiosis research unit of the Medical Research Council, for encouragement and advice, and to the Medical Research Council for supplying the cortisone.

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ELEPHANTIASIS NOSTRAS

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IN 1888 Jonathan Hutchinson described two cases of solid and persisting œdema of the eyelids and face. He said that it usually followed recurrent erysipelas but might occur after injury; the condition was nearly always symmetrical and, if only one side was involved, some other and local cause should be suspected. A few years later he described (Hutchinson 1895) a case in which elephantiasis developed in a leg after an injury; unfortunately he did not give details of the injury but stated that it set up a chronic erysipelatoid infection. Other cases have also been reported of elephantiasis following injury, and in one case the nose was affected. Similar cases, affecting the face and eyelids but without a history of injury, were reported by Weaver and Tunnicliff (1908) and by Beach (1924). The feature common to all has been recurrent attacks of erysipelas.

Case-record

A girl, aged 8 years, was referred to hospital with two years' history of swelling of the eyelids. A few weeks before

Fig. 1—Appearance of patient on admission.

Fig. 2—Appearance of patient during an acute exacerbation.

it first appeared she had bumped her forehead at school. The blow was not severe but nevertheless caused a hæmatoma in the centre of her forehead. A few days later there was discoloration round both eyes but no swelling. The bruising faded slowly during the next three weeks, and a slight swelling was left in the centre of the forehead. A few weeks later the eyelids also began to swell, and this swelling gradually increased and has persisted since then. The swelling had not affected any other part of the body. It was slightly worse in the evening and increased when the patient had a cold. Occasionally there was an acute increase in the swelling leading to closure of the eyes. These episodes were associated with redness and tenderness of the overlying skin, pyrexia, and general constitutional upset. The patient had also had a persistent purulent nasal discharge, but her general health had otherwise remained good. Apart from measles and chickenpox she had had no other illness. She has a brother who is healthy, and both parents are well. There is no history of œdema in any other member of the family.

On examination there was considerable pitting œdema affecting the upper part of the face (fig. 1). The overlying skin was normal, and the eyes were clear. There was no tenderness, and the lymphatic glands draining the area were not enlarged. The veins of the neck were not full, the tonsils and adenoids were small, and there were some mucopurulent nasal discharge and slight œdema of the nares. There was no œdema of any other part of the body, and no ascites or pleural effusion. The heart, lungs, and abdomen were normal, and the blood-pressure was 95 55 mm. Hg. The skin appeared healthy, but the toe-nails were short, grossly thickened, and transversely furrowed. The finger-nails were normal. Examination of the urine showed no abnormality.

Investigations.—The patient was admitted to hospital on Jan. 21, 1953, for further investigation, with the following results: Hb 95%; leucocytes 9000 per c.mm. (neutrophils 67%, eosinophils 6%, lymphocytes 24%, monocytes 2%, Türk cells 1%); Wassermann reaction negative; blood-urea level 39 mg. per 100 ml.; serum-protein level 6·4 per 100 ml.; and serum-cholesterol level 140 mg. per 100 ml.

Progress.—Shortly after her admission to hospital the patient had an acute exacerbation (fig. 2). There was a great increase in the swelling, the overlying skin was bright red and shiny, and there was a sharply demarcated edge. The inflamed areas round both eyes were quite separate, and the bridge of the nose was not affected. The eyes were almost closed, and a little purulent discharge was exuding from the conjunctival sacs. The globes were not affected and appeared quite normal. The patient's temperature, which had previously been normal, rose to 103°F during the day and, despite the administration of penicillin, only settled gradually during the next five days. A white-cell count showed 6000 per c.mm., with a normal differential count. As the pyrexia subsided, the inflammation also settled, slight desquamation of the skin taking place from the fourth day. A few days later the patient's condition was much the same as on admission.

Treatment.—On Feb. 12 bilateral antral washouts were done, pus being obtained on both sides, mainly on the left; but the œdema did not improve, and so on March 2 bilateral antrostomy was done after removal of the anterior ends of both inferior turbinates. Again there was no improvement and so, on the suggestion of Dr. Blair Macaulay, hyaluronidase was injected into the œdematous area on one side in the hope of producing diffusion and dispersal of the œdematous fluid. Since there was no appreciable effect, the procedure was repeated on the other side with a larger quantity of enzyme. Still the œdema did not decrease. Finally the question of a plastic operation was discussed, but it was decided to postpone such measures.

Bacteriology.—Swabs from the nose at the time of the acute incident had produced a growth of hæmolytic streptococci. Later swabs produced a growth of *Staphylococcus aureus*, resistant in vitro to penicillin but sensitive to chloramphenicol. The antral washings also produced a growth of *Staph. aureus* and of *Hæmophilus influenzæ*.

Ætiology

There are many conditions which can cause swelling of the eyelids. The acute conditions, either general (e.g., acute nephritis and whooping-cough) or local (e.g., cellulitis of the orbit and trauma), we can dismiss from further consideration. Similarly we need not discuss further recurrent œdema in which no abnormality is present between attacks (e.g., angioneurotic œdema) or the occasional case of migraine in which local œdema accompanies the headaches.

Persistent swelling of the eyelids may be due to either generalised or systemic disorders or to disease acting locally. Among the systemic conditions which must be considered are the following:

(1) *Cardiac disease:* congestive cardiac failure.—There was no evidence of any cardiovascular disease.

(2) *Renal disease*, especially nephrosis.—The œdema is always generalised and albuminuria is usually heavy. Since there was no œdema elsewhere and the urine was normal, renal function was not further studied.

(3) *Cirrhosis of the Liver.*—There was no history of any previous hepatic disorder, no ascites, and no evidence of portal hypertension. Therefore liver-function tests were not done.

(4) *Anæmia.*—Severe anæmia, whatever the cause, may produce generalised œdema. The patient was not anæmic.

(5) *Allergy.*—There was no history of any other allergic manifestation, particularly urticaria, and no eosinophilia.

(6) *Endocrine Disorders.*—Both hyperthyroidism and hypothyroidism may lead to swelling of the eyelids. Œdema of the lids is an unusual occurrence in hyperthyroidism (apart from the gross œdema which may occur in exophthalmic ophthalmoplegia), but does occasionally develop, constituting one of the lesser-known of the legion of eye signs in this disease (Enroth's sign). The thickening of the eyelids, as well as other areas of subcutaneous tissue, which occurs in myxœdema needs no further comment. There was no evidence of enhanced or depressed thyroid activity in this child. Myasthenia gravis is a condition of doubtful ætiology but possibly associated with a disordered function of the thymus, and so may be considered, and dismissed, under this heading. Œdema of the eyelids is an occasional manifestation. There were no other features in this case to suggest that this was the underlying cause.

(7) *Infections and Infestations.*—Œdema of the lids is a frequent manifestation in filariasis (elephantiasis arabicum), leprosy (elephantiasis græcorum), leishmaniasis (elephantiasis leishmaniana), trypanosomiasis, and myiasis. Œdema of the lids in these conditions is only part of much more striking manifestations, none of which were present here, and the patient had never lived out of this country. Trichinosis, another possible cause in this group, is occasionally seen in this country, and œdema of the eyelids is a well-known manifestation of it. The diagnosis may be difficult, but a well-marked eosinophilia is a fairly constant feature, and this was not present in this case.

(8) *Disease of the Biliary Tract.*—Œdema of the eyelids has been reported in association with gall-bladder disease (Mendes 1951).

(9) *Miscellaneous:* (*a*) lipodystrophy (e.g., Hand-Schüller-Christian disease); (*b*) osteodermopathic syndrome—thickening of the eyelids associated with enlargement of hands and feet and other signs (Duke-Elder 1952).

We must turn then to more local causes of swelling of the eyelids:

(1) *Venous engorgement* may be due to various conditions: (*a*) prolonged blepharospasm; (*b*) an orbital tumour (this is nearly always unilateral); (*c*) compression of the jugular veins; and (*d*) mediastinal tumours compressing the superior vena cava.

(2) *Neoplasms:* (*a*) neurofibromatosis; and (*b*) lymphangioma. These are usually unilateral and are not subject to recurrent inflammation.

(3) *Localised lipodystrophy* is said to be a common cause of baggy eyes in the middle-aged. It is non-pitting and not subject to recurrent attacks of inflammation (*Journal of the American Medical Association* 1951).

(4) *Dermatitis Medicamentosa.*—Chronic œdema may result from the injudicious application of ointments or eye drops (especially atropine); the conjunctivæ are usually involved. There was no history of local medication, none was given in hospital, and no improvement followed the administration of anti-histamine drugs.

(5) *Chronic Orbital Infections.*—Syphilitic myositis and periostitis of the orbit are usually unilateral. Tuberculous periostitis is also unilateral and progressive without treatment, eventually giving rise to a discharging sinus. Rheumatic myositis of the orbit occasionally develops in association with other rheumatic manifestations; it is painful and often associated with proptosis and ophthalmoplegia.

(6) *Chronic Infections of the Eyelids.*—The upper part of the face is a favourite site for erysipelas. This condition is usually of short duration but it does tend to recur, and occasionally there are frequent recurrences with persistent and increasing œdema between attacks, eventually leading to solid induration of the area. This form of erysipelas—erysipelas perstans—was often described by earlier workers and was the main cause of non-tropical elephantiasis or elephantiasis nostras. Unna (1896) recognised two stages: a first or soft stage, and a later hard stage or solid induration often accompanied by changes in the overlying skin.

Discussion

The original sequence of events in the present case is not clear. Whether the patient developed a low-grade inflammation after the original injury, or whether the injury may have caused local thrombosis in the vessels, cannot be decided. Whatever the original lesion, she has subsequently been having recurrent attacks of erysipelas, with the development of the soft stage of elephantiasis nostras.

Treatment presents many problems. Attention to local sepsis has always been emphasised, but treatment of the concurrent sinus infection led to no improvement. Possibly the sinus infection was an effect rather than a cause, intranasal œdema narrowing the ostia and allowing subsequent infection.

Weaver and Tunnicliff (1908) reported a dramatic response to an autogenous vaccine killed with galactose. The treatment was given when vaccine therapy was in its heyday, and they give a striking chart showing the rise in the opsonic index parallel with the clinical improvement.

Various plastic operations have been advocated, and reports have appeared of success and of failure with each one.

The trial of hyaluronidase was based on the report of Ferrero (1952) claiming improvement of chronic limb œdema after intra-arterial injection. Intra-arterial injection on the face would be hazardous; hence the fact that I did give it subcutaneously must not be taken as a criticism of Ferrero's work.

Although some form of plastic surgery is probably the only thing that can be done, I fear that the end-result may be as bad or worse than the present condition.

Summary

A case is described of persistent œdema of the eyelids following a minor injury.

The differential diagnosis and treatment are discussed.

References at foot of next column

BODY-IMAGE DISTURBANCES
IN PATIENTS ATTENDING A PSYCHIATRIC OUTPATIENT CLINIC

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THE term "body-scheme" was first used by Head and Holmes (1911–12) to signify a person's concept of his own body:

"It denotes the awareness that the body is an object, comprising parts, occupying space, which are in spatial relationship to each other."

Many papers have been published since then describing various phenomena connected with body-image disturbances, but most of them have been concerned with specific brain lesions or with the phenomenon of a phantom image. These papers were comprehensively reviewed by Critchley (1950).

Lippman (1952) published a series of cases in which disturbances of body-image were the main feature. Most of these cases were associated with migrainous headaches, but in many of the cases he did not describe any headache as being present. He described the patients as mentally normal and showed how it was only by direct questioning that these disturbances were elicited.

Present Study

To confirm and to study further these phenomena 41 patients attending a psychiatric outpatient department of a provincial teaching hospital were examined. These patients represented a typical cross-section of those usually attending a clinic of this description, where the patients had been referred in about equal proportions from outside general practitioners and from other departments of the hospital.

The patients studied were unselected except for the exclusion of those with: (1) history of head injury; or (2) physical signs of organic disease (cases with mild hypertension were not excluded); or (3) gross delusions, or those who were so unreliable that one felt that little importance could be attached to their description of their symptoms (most of these were cases of either organic dementia or gross schizophrenia).

After the patient had given a full spontaneous description of his symptoms he was asked directly: "Do you ever notice that parts of your body appear to increase or decrease in size?" The reality of these experiences to certain patients was marked by their immediate responses, with a full description of their particular sensation. Those patients who did not experience any changes of this description appeared bewildered, and seemed to wonder what was meant.

The body-image was disturbed in 13 cases, and the disturbance fell into one of three groups according to its relationship to other events:

(1) The sensation was related to headache of a migrainous character (4 patients).

(2) The sensation was related to the onset of sleep—i.e., was really a form of hypnagogic hallucination (5 patients).

(3) The sensation was not directly related in time to either sleep or headache (4 patients).

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The variations of body-image disturbances noted were :

Decrease in size : head 1 case, whole of body 1 case, feet 1 case, and fingers 1 case.

Increase in size : head 5 cases, whole of body 2 cases, lips 1 case, and hands and fingers 3 cases.

Conclusion

Body-image disturbances are very common, occurring in 13 of 41 patients attending a psychiatric outpatient clinic.

Usually the disturbance consisted in a subjective increase in size of the head or of the fingers. These subjective sensations occurred in roughly equal numbers in relation to migraine, sleep, or neither of these.

Such disturbances are elicited only by direct questioning.

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POSTOPERATIVE PERIPHERAL VASCULAR FAILURE

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THE two cases of postoperative peripheral vascular failure reported here illustrate a condition which appears to be distinct from operative or oligæmic shock, and is not associated with recognisable cardiovascular disease. It may be identical with the so-called "adrenal crisis."

Case-reports

Case 1.—A man, aged 26, in excellent general health except for a duodenal ulcer which had been present for three years, was submitted to elective partial gastrectomy on Oct. 26, 1951. His immediate postoperative condition was satisfactory, except for a rather rapid pulse. During the following thirty-six hours, however, its rate fell from 120 to 100 per min.

On Oct. 28 his appearance and temperature chart gave rise to some anxiety. He was not pale, but was slightly cyanosed. His pulse-rate was 140 per min. and its volume was poor. His temperature was 101·6°F and his respiration-rate 24 per min. Careful clinical examination revealed nothing except some impairment of the percussion note at the base of the left lung. He was calm, and not distressed. His blood-pressure was not taken. No treatment was given, and he died an hour or so later—forty-eight hours after operation.

Necropsy revealed no abnormality except some basal congestion of both lungs. The suprarenal glands appeared normal, and the operation site was satisfactory. Death was attributed to "cardiac failure following gastrectomy."

Admittedly the gravity of this man's condition was fatally underestimated. Too much emphasis was placed on his excellent preoperative condition, the knowledge that the operation had been straightforward, and the complete absence of mental or physical distress.

Case 2.—A 47-year-old glass-blower, who had suffered from duodenal ulcer for twelve years, was admitted under the care of Dr. A. L. Punch with the clinical and radiological features of pyloric stenosis. There were no other significant findings, apart from evidence of some pulmonary emphysema. His blood-pressure was 140/100 mm. Hg, pulse-rate 80 per min., Hb 110%. The serum-proteins and electrolytes were within normal limits. On Aug. 14, 1953, an anterior Polya-Hofmeister gastrectomy was completed without difficulty in an hour and a quarter. Blood-loss was negligible.

Progress.—At about 11 P.M. on the day of the operation, the patient's condition was satisfactory except for rather poor pulse volume. He was fully conscious, and his general appearance was gratifying.

The following morning he was sitting up in bed and smiling, and said he felt very well. His colour was good except for slight cyanosis of the lips. His nose and hands were cold, and there was a little sweat on his forehead. His radial pulse was just perceptible and very rapid. No blood-pressure could be recorded on the sphygmomanometer, and no heart sounds could be heard with a stethoscope. The neck veins were not engorged.

Peripheral vascular failure was diagnosed, and two doses of 15 mg. of 'Methedrine' were given in rapid succession, the first intramuscularly and the second intravenously. Since neither injection produced any effect, a continuous intravenous infusion of *l*-noradrenaline in normal saline was started, and the blood-pressure was rapidly and easily brought under control ; the solution, consisting of 16 mg. of noradrenaline per litre of fluid, was given at a rate varying from 15 to 30 drops per minute, to maintain a systolic pressure of about 130 mm. Hg.

The noradrenaline induced profuse sweating, and the patient remained awake and mildly euphoric for the first twenty-four hours of its administration. His general condition then began to deteriorate and he became somewhat incoherent. Sleep was induced and maintained for several hours with small doses of thiopentone.

Care was taken to maintain an accurate electrolyte balance, but the patient showed no signs of being able to take over his own vasomotor control. Temporary withdrawal of the noradrenaline after nine hours had resulted in a steady fall of blood-pressure and rise of pulse-rate ; the drip was re-started when the systolic pressure fell to 100 mm. Hg.

Extract of adrenal cortex ('Eschatin' 6 ml.), given at an early stage, had produced no appreciable effect ; and Dr. James Rochford, consultant anæsthetist to the hospital, suggested that a small transfusion of fresh blood might supply some missing factor which we were not able to define. This transfusion, of half a pint of blood donated by the ward sister, was undoubtedly the turning-point in his treatment. As soon as 2 oz. had run in, his blood-pressure rose abruptly : it was possible to reduce the rate of the noradrenaline drip, and to discontinue it completely three-quarters of an hour later. Corticotrophin and cortisone, although available, were deliberately withheld to avoid confusion of the issue.

His recovery thereafter was uneventful, except for diarrhœa and postprandial giddiness which persisted for a fortnight. This diarrhœa, and the diuresis which followed withdrawal of the noradrenaline drip, were probably the causes of a steady fall in serum-potassium which, when the level reached 14 mg. per 100 ml. on the fourth postoperative day, was associated with some lethargy. There was a rapid response to the administration of 15 g. of potassium chloride by mouth. His blood-urea, which rose to 150 mg. per 100 ml. on the third day after operation, soon returned to a normal level.

During the fourth week of his convalescence a Thorn test was carried out. The total eosinophil-counts before and four hours after administration of 25 mg. of corticotrophin were respectively 200 and 260 per c.mm.

Comment

Circulatory failure of this type is distinguishable from oligæmic shock by the following features :

1. The patient has not lost blood or fluid, or been traumatised, to an extent which might be expected to produce "shock." Failure to respond to adequate transfusion, in cases where the blood volume has been depleted, should be regarded as of equal significance.

2. Vasoconstriction of the skin vessels, and therefore pallor, is absent ; but slight cyanosis is a tell-tale sign of the utmost importance. This absence of pallor, coupled with the astonishing tranquillity and sense of well-being of the patient, is very deceptive. It would have been possible for a trained observer to converse with either of the patients described without any suspicion that they were practically pulseless. The condition is clinically identical with the peripheral failure which sometimes accompanies postoperative peritonitis.

3. There can be an appreciable time-lag between operation and the fully developed picture of circulatory failure. Its onset, however, is insidious.

4. The temperature may be raised in the early stages.

The two cases described suggest that one must be on the watch for occasional cases of postoperative

peripheral vascular failure developing in apparently good-risk subjects. These cases can be diagnosed at an early stage only by careful and repeated blood-pressure readings. If the systolic blood-pressure falls below 100 mm. Hg it would seem advisable to bring the patient under control by drip infusion of noradrenaline in saline. Once this has been done there is time to review the case.

Lundy (1953) draws attention to the "unexplained shock" which sometimes follows operation on patients who have previously received treatment by corticotrophin or cortisone, and believes that some patients may have "insufficient adrenal cortical function to maintain themselves adequately under conditions of stress, even though they may never have received cortisone or A.C.T.H."

He describes the case of a patient who died three hours after a cup arthroplasty for cortisone-treated rheumatoid arthritis. The patient's blood-pressure remained at a satisfactory level throughout the operation, but shortly afterwards fell to 86/60 mm. Hg. It continued to fall despite the transfusion of about a litre of blood and 250 ml. of plasma, the intravenous injection of 10 ml. of adrenal cortical extract, and small doses of epinephrine given intravenously and into the heart. Lundy remarks: "Instead of showing the usual signs of vasomotor collapse and shock, the patient appeared somewhat flushed, and . . . his axillary temperature rose to 102 degrees F." At necropsy the most striking finding was pronounced atrophy of both adrenals.

In this and other reports the postoperative or post-partum collapse is described as "shock." However, the peripheral vascular failure which is the striking feature of this collapse is unlike oligæmic shock, in which the peripheral vascular tree reacts promptly and vigorously. It is quite probable that the two conditions can co-exist and require parallel treatment. This may be the explanation of resistant cases of "obstetric shock," and of "irreversible shock."

I should like to thank Dr. James Rochford for his invaluable help and advice in the management of case 2.

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Reviews of Books

Fundamentals of Clinical Cancer

With Emphasis on Early Diagnosis and Treatment. LEONARD B. GOLDMAN, M.D., clinical professor of radiotherapy, New York Medical College. London: J. & A. Churchill. 1953. Pp. 312. 60*s*.

IT is significant of the position achieved by his young specialty that a radiotherapist can offer a book of this kind, supported by a claim to have treated 10,000 cancer cases in the last twenty years. Professor Goldman attempts to consider primarily "the fundamentals of the early diagnosis of cancer," and disarms criticism to some extent by stating that he has tried to do this by limiting the text and illustrations where possible to those lesions which can be controlled, while uppermost in his mind was the desire to write simply and concisely, and "recommendations are focused on *what to do*, rather than *how to do it*." In a book of this size these laudable ambitions inevitably betray him into a good deal of oversimplification and some omissions; but all the same he has produced an interesting volume, full of useful clinical aphorisms and information about malignant disease. His facts are made readily accessible, and provide a stimulus to accurate clinical observations during the rush of routine duty. He is not unfairly biased towards his specialty, but admits its limitations, always advocating surgery where this is the treatment of choice.

The size of his subject often obliges him to generalise, and some readers may feel they would readily sacrifice the illustrations of large pieces of apparatus in favour of more detailed accounts of an obviously wide clinical experience. The dosage system proposed is singularly inadequate, besides being outmoded by the joint work of Paterson and Parker (which is dismissed in two lines). It is perhaps an unfortunate coincidence that advice to treat squamous-cell cancer by single X-ray doses of the order of 4000 r should be given on the same page as illustrations of squamous cancer of the pinna, whose cartilage is notoriously subject to late radiation injuries. At the order of dosage mentioned these might be severe enough to demand amputation of the organ for relief. Many other illustrations, however, enforce some point well.

The "annual cancer detection examination," advocated in the section on cancer of the nasopharynx, has not achieved popularity in this country. The clinician who recalls the patient with enlarged glands in the neck secondary to a tiny primary in a eustachian orifice or fossa of Rosenmüller, and only detectable at a much later stage, will perhaps fail to agree that this measure is likely to lessen the mortality from what is, on the whole, one of the less common forms and sites of cancer.

Many readers would welcome a fuller account of Professor Goldman's experience, and we hope that in further editions the scope and pattern of this book will be considerably enlarged.

A Surgeon's Life

FERDINAND SAUERBRUCH. Translated by FERDINAND C. RENIER. London: Andre Deutsch. 1953. Pp. 297. 15*s*.

THIS is a "success story" of a kind which is becoming familiar. The late Professor Sauerbruch was not only a very distinguished German surgeon; he was also a musician, and he sets the key of his autobiography with an account of how, as a young man, he dined at a big hotel, drank "one glass of heady wine after another," offered to take the place of the trumpeter in the orchestra, and "blew so loudly in the triumphal march from *William Tell* that the diners turned to gaze in amazement."

Medical readers will be most interested in the account of the development of thoracic surgery in which Sauerbruch gained his international reputation. They will also relish some striking case-histories, which include those of two Balkan kings, Lenin when a student, President Hindenburg, and Ludendorff. But the book is not all about surgery. During the first world war Sauerbruch broke his promise of neutrality, made to the Swiss government, and acted as a special courier between the King of Greece and the Kaiser, and later between the Kaiser, the King of Bulgaria, and the Sultan of Turkey. He tells also of interviews with Hitler and of the fall of Berlin.

The book is intended for the ordinary reader. It is written with gusto and is very readable, revealing an impetuous, dictatorial, outspoken yet kindly martinet who was something of a genius.

The Alkaloids

Chemistry and Physiology. Vol. 3. Editors: R. H. F. MANSKE, H. L. HOLMES. New York and London: Academic Press. 1953. Pp. 422. $11.00.

WE have already reviewed the first two volumes[1] of this treatise. The third volume covers nine groups of alkaloids, each group being described by an expert, sometimes with an associate.

R. B. Turner and R. B. Woodward give an admirable account of the investigations which culminated in the determination of the structure of the cinchona alkaloids, and led to the syntheses of hydroquinine and hydroquinidine by Rabe and his collaborators in 1931, and of quinine by Woodward and Doering in 1944–45. Of the minor cinchona alkaloids recorded, three well-authenticated items, cinchonamine, quinamine, and conquinamine are also described. In them the quinoline portion of the usual cinchona alkaloid is replaced by an indole system. This monograph concludes with a note on biogenetic relationships in the group.

The other monographs, including those on the alkaloids of ephedra, ipecacuanha, and jaborandi, are more conventional in content and usually begin with a statement of occurrences, methods of extraction and isolation, and colour reactions. The

1. *Lancet*, 1951, i, 33; *Ibid*, 1952, ii, 274.

chief physical properties of the alkaloids and their derivatives are mostly given in comprehensive tables, which make for ease of reference. Finally the determination of structure and the method of synthesis, if this has been achieved, are dealt with. Sometimes a note on biosynthesis is added, as in the case of the angostura alkaloids included in H. T. Openshaw's account of quinoline alkaloids other than those of cinchona, and some of the monographs include brief references to the physiological action of the alkaloids. All are well documented and generously provided with graphic formulæ.

Nutritional Studies in Adolescent Girls

And Their Relation to Tuberculosis. JOSEPH A. JOHNSTON, M.D., pediatrician-in-chief, Henry Ford Hospital, Detroit. Springfield, Ill.: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1953. Pp. 320. 55*s.*

IT is generally agreed that there is an association between tuberculosis and a poor state of nutrition; it is also agreed that there is a sudden increase in the incidence of tuberculosis, and that the mortality-rate rises steeply, in the adolescent period, particularly in girls. Dr. Johnston sets out to prove that these two facts are connected, and that the increase in the adult form of tuberculosis in adolescence is related to a failure to meet the nutritional requirements for growth.

He does this by making a study of the metabolic balances of nitrogen and calcium in adolescent girls suffering from tuberculosis, and this book sets out his findings in considerable detail. Case-histories and figures for intakes and outputs of nitrogen and calcium are given for a number of individual girls, some of whom were studied continuously for six months or more. The effect of additional vitamin D and of various hormones on the retention of nitrogen and calcium was investigated in some of the patients and the retentions during periods of rest and activity were compared. He concludes that there is a correlation between adequate storage of nitrogen and a favourable course of the infection. Negative nitrogen balances or inadequate retentions were often associated with a failure to heal, though it was not always clear that the one was a direct consequence of the other.

Traitement des hémorragies

JEAN-PIERRE SOULIER, médecin-assistant des Hôpitaux de Paris. Paris: Éditions Médicales Flammarion. 1953. Pp. 217. Fr. 1400.

Dr. Soulier, not satisfied with discussing hæmorrhagic diseases, devotes a large section—almost half the book—to brief notes on the treatment of bleeding from every imaginable local source. The result is an uncritical mass of detail mainly compiled from other people's views. The first section of the book deals with the pharmacology of hæmostatic substances, and the author's passion for completeness leads him to list—without indication of their relative value—such outlandish substances as "venin de crapaud" and the "hemostatic rabbit globulin of Parfentjev." Mingled with all this is much sound sensible advice on the management of the primary hæmorrhagic disorders. It is a great pity that Dr. Soulier did not confine his attention to this field: one cannot imagine a gynæcologist or an ophthalmologist, for example, consulting a book like this in order to find out how to treat hæmorrhagic hazards in his special field.

We Are What We Eat

Food Health for Home and School. A. B. CUNNING, M.B.; F. R. INNES, M.B. London: Salvationist. 1953. Pp. 85. 2*s.* 6*d.*

THIS little book is written by two people with a mission. They believe in "natural" foods grown without artificial fertilisers and preferably eaten raw. In the 1930s they were impressed by the results that Dr. Dorothy Hare and the late Dr. Pillman Williams were obtaining at the Royal Free Hospital in patients with rheumatism who were being treated with a raw-food diet. During the war, when Dr. Cunning was responsible for feeding evacuee children, she had the chance of giving them a diet of whole cereals and raw food, and she tells us that their eczema, asthma, insomnia, migraine, and constipation were thereby overcome and their teeth improved. After the war a similar diet was introduced at a Salvation Army Home for retarded children, and this book describes in simple language the work and its results. One surprising claim made is that the diet improved intelligence and cured delinquency. Among the recipes and menus at the end of the book is a "Borstal or prison régime."

The hard-baked scientist can find much to criticise in this book; but "enthusiasm moves the world," and if the authors have infused the children with a fraction of their own, it is not surprising that they can record both mental and physical improvement in their charges.

Determination of Adrenocortical Steroids and their Metabolites

2nd Memoir of the Society of Endocrinology. Editors: P. ECKSTEIN and S. ZUCKERMAN. London: Dennis Dobson. 1953. Pp. 91. 12*s.* 6*d.*

THIS volume contains the proceedings of a conference of leading workers on the adrenocortical steroids held by the Society of Endocrinology last May. The papers are divisible into two main groups—those using formal chemical techniques for estimating steroids, and those using paper chromatographic separation. The most outstanding contribution is the account by Simpson and Tait of the detection of a previously unidentified adrenal hormone,[1] electrocortin, which may prove to play an important part in the control of electrolyte metabolism. The book would be valuable for this section alone, but potential readers should understand that it is a report on work in progress rather than a final statement on the estimation of adrenocortical steroids.

Rehabilitation of the Physically Handicapped (2nd ed. London: Oxford University Press. 1953. Pp. 275. 32*s.*).—While the general principles of reablement and resettlement are nowadays accepted throughout the Western World, there are still wide differences in their application. This book, written by Dr. Henry H. Kessler, a leading American worker in this field, is naturally coloured heavily by American circumstances. Thus, in his section on the injured worker, Dr. Kessler starts from the point that the term "permanent disability" has primarily an actuarial or legal connotation; it designates certain categories of injuries which entitle the injured to financial benefit or compensation. The American situation is complicated throughout by differences in legal interpretation from one State to another. Twenty-five States have a limitation of the period during which an employer or his agent is held responsible for the medical care of an injured workman, the period ranging from 2 weeks in Massachusetts to 100 months in Arizona. There are similar variations in the maximum amount payable to an injured worker. But in one respect the care of the injured workman is beset by difficulties not very unlike those experienced nearer home; Dr. Kessler finds that perhaps the greatest bar to complete reablement is the complex pattern of relationships that underlies the present system of compensation administration. "In the United States the hearings are standard practice: they have degenerated into a pseudo-system of medical jurisprudence that has been frequently referred to as 'Court-House Medicine.'"

The size of the problem of reablement and resettlement in America is revealed in the estimates, issued by the Commission on Chronic Illness, that $1^1/_2$ million persons in the United States are totally disabled by chronic disease, and $5^1/_2$ million partially disabled. In a section on chronic disabilities Dr. Kessler reviews the problems presented by those suffering from tuberculosis, cardiac and renal disease, peptic ulcer, and diabetes. It is estimated that there are 1 million known diabetics in the United States; prejudices against the employment of diabetics have arisen from misinformation concerning the practice and routine requirements of the insulin-taker—the idea that time off work is required for injections and specimen-taking, that special canteen arrangements are necessary, and so on. There are many other interesting chapters, particularly those dealing with vocational guidance, vocational training, and placement, and the book can be commended to those in this country who are concerned with the well-being of the disabled.

1. Simpson, S. A., Tait, J. F., Bush, I. E. *Lancet*, 1952, ii, 226.

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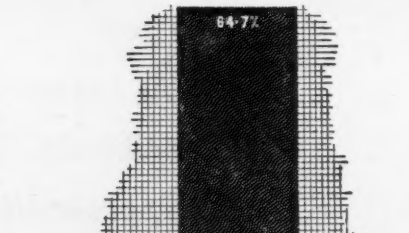

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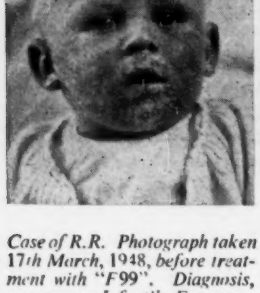

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THE LANCET
LONDON: SATURDAY, JAN. 9, 1954

Rest and Movement

REST has been deemed necessary in the treatment of certain injuries and diseases since time immemorial, but no great emphasis was laid on this need until quite recently. The ancient Egyptians applied splints of bark and papyrus when treating fractures, and the Arabs used plaster-of-paris for the same purpose; but we do not know whether the object was simply to relieve pain and retain the alignment of the limb, or whether splinting was thought to serve a more definite therapeutic purpose. HIPPOCRATES taught that active exercise was inadmissible in febrile diseases and reproved the quacks who treated fever with gymnastics, shampooing, and wet sheets. The attitude to rest remained the same throughout the Middle Ages. Even AMBROISE PARÉ, one of the first surgeons to attempt to escape from the tradition of the Ancients, mentions the value of rest only in passing. For example, he writes of the treatment of fracture of the patella, or whirl-bone of the knee:

> "For the Prognostick, this I affirm, that I have seen none of those who have had this bone fractured who have not halted during the rest of their lives. The cause hereof is, the knitting by the concretion of a Callus hinders the free bending of the knee; going, especially on even ground, is more easie to the Patient but an ascent is far more difficult, and absolutely painful. The Patient must necessarily for this kind of Fracture lie or keep his Bed, at the least for Forty Days."

Even in more modern times rest was accepted as an evil to be suffered rather than praised; and so it was that JOHN HILTON, the first to extol rest as a positively beneficial measure, found it necessary to excuse himself for so impious a belief. HILTON, a surgeon of Guy's Hospital, gave a series of lectures at the Royal College of Surgeons of England in 1861–63 entitled Rest and Pain. He prefaced his thesis by explaining that although God ordained that man should live by "the sweat of his face," he did in His goodness permit the rest of sleep. And then he bravely advocated rest as a curative agent.

This was the beginning of a new era in therapeutics—a step that marked a change in medical practice which, in its way, was as great as that following the introduction of antibiotics. Since then the value of rest has been increasingly appreciated and its praises sung in season and out. But like all new ideas (and in the treatment of disease a fundamental idea that is less than a hundred years old is new) it was soon misapplied. The treatment of fractures is a good example. The surge of enthusiasm for rest corresponded with the development of radiology, which made it possible to set broken bones accurately. What could be more natural than to splint the bone in its proper position and then place it at rest? Indeed, this is what happened, and in the early part of this century the results of the treatment of injuries of the limbs reached a low ebb. Previously a broken bone might have united with deformity and there might have been a permanent limp, but at any rate functional activity was retained. Now, however, although with the help of X rays the bone was straight, the damaged ligaments and muscles were made stiff by the enforced rest and functional activity was lost, only too often for ever. Orthopædic surgery came into existence largely to remedy this situation; orthopædics might even be said to have grown to its present stature by reason of its exponents' understanding of the importance of functional activity. After the first world war, under the tutelage of Sir ROBERT JONES at Shepherd's Bush, the keynote was restoration of function. Later, when orthopædic surgeons undertook the primary treatment of injury, the emphasis changed to the maintenance of function. Stimulated by the teaching of BÖHLER and of WATSON-JONES, orthopædic surgeons encouraged active use of the muscles surrounding the fracture while the alignment of the bone was secured by a splint. Soft-tissue injuries were handled similarly, and there are now few surgeons who treat a sprain of a ligament or a tear of muscle-fibres otherwise than by activity from the moment of injury. The orthopædic surgeon has tried to combine the virtues of rest with the need for activity. This is, indeed, the very foundation of his practice. But it is well for a belief to be questioned from time to time: it prevents complacency. A challenge has now been made, not by quacks as in the days of ancient Greece, but by the high authority of Mr. GEORGE PERKINS, professor of surgery in the University of London. In a Robert Jones lecture,[1] also delivered at the Royal College of Surgeons, he has ventured to cast doubt on the universal validity of HILTON'S thesis. Many of the arrows he loosed were at targets set up for the occasion—targets that his colleagues thought to have been shot to pieces years ago—but some of his shafts have found new marks.

Three methods of treatment are possible in orthopædic practice: move it, keep it still, or cut it out. The difficulty is to know when to advise one or another. PERKINS analyses the indications for movement and rest. He agrees that inflammation should be treated by rest, but insists that the word "inflammation" must be applied only to the initial reaction of the body to attack by a harmful agent. The second stage which follows after the invader has been repelled is the stage of repair, and this should be treated by activity, by resumption of function and movement. He claims that with bacterial invasion the first stage passes to the second when the patient has acquired an immunity. This idea is worth careful investigation. All will agree that a switch in treatment from rest to activity is necessary at some point, but immunity is only a comparative state which has yet to be accepted as a reliable guide.

PERKINS throws his glove in challenge of the local treatment of tuberculous arthritis. There was no treatment of this disease before JOHN HILTON'S day. HILTON claimed success from rest: rest for the patient in bed, with the limb rested on a splint. In his own words "treated by rest; cured by anchylosis." H. O. THOMAS, a few years later, brought to the notice of the medical profession even more remarkable successes with the same disease treated

1. *J. Bone Jt Surg.* 1953, 35B, 521.

by "a combination of enforced, uninterrupted and prolonged rest; the first gives relief from pain; the second added to the first enables the case steadily to progress to a cure: the third secures that which has been gained." To this day we have nothing further to offer during the acute stage except chemotherapy, which cannot be regarded as more than an adjuvant. Prolonged immobilisation does, indeed, have a dreadful effect on growth of the limb as a whole and on other joints, and the assertion by PERKINS that future generations will regard our present practice as stupid may be warranted. But the effects of resuming activity as soon as there is general immunity to the infection are not known to be less harmful; it is for the challenger to show they are.

A second challenge to orthodoxy is made over treatment of injury. PERKINS claims that rest is never indicated because the cause of the inflammation has disappeared before the patient is even seen by the doctor. He contends that splintage is rarely needed for the purpose of securing union of a fractured long bone, since this will be brought about by the muscles which span the fracture and compress the ends of the bone against one another. He enunciates the general principle that splintage is essential for bony union only when there are no muscles attached to the fragments capable of impacting the bone ends. Such fractures are only three: fracture of the carpal scaphoid, transcervical fracture of the neck of the femur, and fracture of the medial malleolus. In illustration of this thesis he points out that fractures of the humerus can unite satisfactorily when treated only by the support of a sling. He gives no advice, however, on the treatment of other long bones except to recommend internal splinting when this will allow an external splint to be dispensed with.

PERKINS's challenge has been accepted by Sir REGINALD WATSON-JONES; and those who resist Professor PERKINS's thesis could have no finer champion than this pioneer of the doctrine of functional activity. In the Bradshaw lecture delivered at the Royal College of Surgeons on Dec. 9 he set out to justify the modern practice. This, so far as concerns most fractures of the shaft of long bones, can be stated as follows: reduce the fracture and restore alignment; apply a splint both to maintain the position and to facilitate union by preventing movement between the fractured surfaces; constantly use the muscles bridging the fracture to prevent stiffness. Two worthy opponents are in the lists, and the next bout is awaited with excitement.

Blindness and Oxygen

THE tragic development of partial or total blindness in premature infants has for some time been feared to be related to the administration of oxygen. Last September ASHTON et al.[1] in this country reported experimental work which provided the first conclusive evidence that high concentrations of oxygen can seriously interfere with the normal process of retinal vascularisation and so initiate a train of events which may lead to bilateral intra-ocular disorganisation. This important observation has now been confirmed independently in the U.S.A.[2]

A new ocular disorder, confined almost exclusively to premature infants, was first described in 1942 by TERRY,[3] of Boston, who named the disease "retrolental fibroplasia" since the final stage is characterised by the formation of a fibrovascular membrane behind the lens. This disorder is now known to be the commonest cause of blindness in infants today. Thus REESE [4] estimates that of the cases of blindness in American children below school age, about a third are attributable to retrolental fibroplasia; while in Great Britain MOFFATT [5] reports that this is the cause of blindness in 12% of children in "Sunshine Homes." The incidence of the disease fluctuates remarkably, but it is generally reported to be rising. In Chicago, for instance, the incidence in babies of comparable birth weight rose from 6·8% in 1937–46 to 30·4% in 1946–48 [6]; and in Oxfordshire, Buckinghamshire, and Berkshire, of six cases of blindness in infants in 1947 only one was attributed to retrolental fibroplasia, whereas in 1949 this disorder accounted for six of seven cases.[7] In the U.S.A., where the condition is most prevalent, it has been estimated that about 650 cases of advanced retrolental fibroplasia are to be expected each year. It is not surprising, therefore, that a great deal of research has been concentrated on the problem.

It was not until the early stages of the disorder were observed clinically and studied histologically that the true nature of the process became evident. The primary change is angioblastic and presents postnatally as an overgrowth of the retinal vessels, which are still developing in the eye of the premature baby; exuberant vasoformative tissue bursts into the vitreous, and protein transudates, seeping through the immature vessel walls, form fibrous bands which on contraction detach the retina and carry the fibro-angioblastic tissue forwards in the vitreous to form the retrolental membrane. The stimulus which normally attracts the vessels into the retina is unknown; but it is assumed to be a response to the oxygen demands of the inner layers of the retina—demands which, as the eye develops, the choroidal circulation can no longer satisfy. If retrolental fibroplasia begins simply as an overgrowth of normal vasoformative tissue, the first obvious hypothesis to be considered is that it may develop in response to a stimulus which is normal in nature but excessive in degree—a variation which would thus appear to be related to a disparity between oxygen supply and demand. Several workers have suggested that anoxia is the most important causative factor.

This concept is supported by the work of INGALLS et al.,[8] who reported lesions resembling retrolental fibroplasia in the offspring of mice subjected to an anoxic insult during pregnancy. SZEWCZYK [9,10] pointed out that the developing retina utilised oxygen at a rapid rate and that pathological changes might, therefore, develop within it in conditions of subclinical anoxia from whatever cause. This view was criticised by CROSSE and EVANS,[11] who observed that if the disease were due to oxygen deficiency it would be impossible to explain the

1. Ashton, N., Ward, B., Serpell, G. *Brit. J. Ophthal.* 1953, **37**, 513.
2. Patz, A., Eastham, A., Higginbotham, D. H., Kleh, T. *Amer. J. Ophthal.* 1953, **36**, 1511.
3. Terry, T. L. *Ibid*, 1942, **25**, 203.
4. Reese, A. B. *Ibid*, 1948, **31**, 623.
5. Moffatt, P. M. *Proc. R. Soc. Med.* 1950, **43**, 223.
6. Hepner, W. R., Krause, A. C., Nardin, H. E. *Pediatrics*, 1950 **5**, 771.
7. Coxon, M. W. *Trans. ophthal. Soc. U.K.* 1951, **71**, 591.
8. Ingalls, T. H., Tedeschi, C. G., Helpern, M. M. *Amer. J. Ophthal.* 1952, **35**, 311.
9. Szewczyk, T. S. *Ibid*, 1951, **34**, 1649.
10. Szewczyk, T. S. *Ibid*, 1952, **35**, 301.
11. Crosse, V. M., Evans, L. P. J. *Arch. Ophthal., N.Y.* 1952, **48**, 83.

absence of the disease before 1940 when oxygen was rarely administered. According to SZEWCZYK, long-continued supplemental oxygen therapy may help to bring about retrolental fibroplasia in the premature baby by acclimatising the retina to an enriched atmosphere, so that a sudden transfer to normal atmospheric conditions results in retinal hypoxia; in his latest report [12] he states that this is undoubtedly the greatest single cause of retrolental fibroplasia. Whether this is true or not—and we believe it is—there is no evidence to prove his contention that retinal tissue when continuously supplied with excessive quantities of oxygen becomes intolerant to its sudden reduction.

There is, however, further evidence incriminating oxygen in retrolental fibroplasia. In Melbourne, CAMPBELL [13] found that the incidence of the disease was higher in those hospitals where oxygen therapy was applied liberally than in those where it was used more sparingly. This report was subsequently amplified by RYAN,[14] who suggested that oxygen stimulated mitotic activity and thus led to abnormal proliferation of vessels and of glial and fibrous elements; an increased growth-rate of the inner layer of the optic cup resulted in retinal detachment. In England CROSSE and EVANS [11] found that the amount and duration of oxygen therapy was directly related to the incidence of the disease—a finding which was supported by PATZ et al.[15] in Baltimore. The Baltimore workers suggested that the disease was directly due to the toxic effect of oxygen; but this view seems to be at variance with the reports by SZEWCZYK and JEFFERSON [16] that the early stages of the disease may rapidly regress when the infant is replaced in high concentrations of oxygen. Thus according to most workers the condition may be due to anoxia or to relative anoxia following administration of oxygen, or to the toxic or stimulative effects of high oxygen levels; but some believe that oxygen is not a causative agent or may be only one of the factors involved.

The experimental work of ASHTON and his co-workers has helped to reconcile these apparently conflicting views. This group studied the effects of high oxygen concentrations on the developing retinal vessels in the kitten. This animal was selected because the extent of retinal vascularisation in the full-term kitten at birth and in the ensuing three weeks is comparable to that in the premature baby, and because the mode of retinal vascular development is similar in all other respects.

When kittens a few days old were kept in concentrations of 60–80% oxygen continuously for four days, and then anæsthetised and injected intracardially with indian ink, the ingrowing complexes of retinal vessels were found to be completely obliterated. No other vessels in the body—including the hyaloid artery and tunica vasculosa lentis—showed this remarkable change. ASHTON et al. suggest that hyperoxia may extend the nutritional range of the choroid and so nullify the vasoformative stimulus in the inner layers of the retina; the ingrowing vessels thus become redundant and atrophy. On the other hand, this obliterative effect may result simply from the vasoconstrictive action of oxygen, or even of a metabolite formed in these circumstances, on the growing vessels. When the animals were returned to air the obliterated vessels only partly reopened, and vascular budding recommenced from the disc, as in utero; but this new growth was abnormally dense and it extended as a disordered network both into the retina and into the vitreous. The pathological picture of the early stages of retrolental fibroplasia was thus exactly reproduced. The severity of the oxygen-obliterative effect was found to be proportional to the degree of immaturity of the retinal vascularisation, to the duration of exposure to oxygen, and to the concentration of oxygen.

PATZ et al.[2] have since reported the production of the proliferative changes characteristic of retrolental fibroplasia by exposing newborn mice, kittens, and puppies to 70–80% oxygen for varying periods. The eyes were examined only histologically, so the oxygen-obliterative change was not observed.

The clinical findings that retrolental fibroplasia is largely confined to premature babies, is commonest in the smaller weight-groups, and is related to oxygen exposure are all understandable on the basis of these experiments; they resolve the paradox of anoxic conditions resulting from high oxygen tensions; and the apparently opposing views that the disease may be due either to hypoxia or to hyperoxia become reconcilable. Nor is it difficult to believe that the abnormal proliferating vessels may also be obliterated when the infant is returned to high oxygen concentrations. In the premature baby the disease may not arise exactly as in the kitten, but the process is probably very similar. At the same time recognition of the primary importance of oxygen in the genesis of retrolental fibroplasia should not obscure the need to determine the secondary factors, the importance of which is apparent from the fact that the disease is not found in all infants exposed to high oxygen concentrations.

The mechanism of the oxygen-obliterative change and the nature of the vasoformative stimulus are still unknown. Meanwhile, these recent experimental findings entirely support clinical impressions that oxygen is important in the genesis of retrolental fibroplasia; they indicate that the uncontrolled administration of oxygen to a premature baby can seriously threaten vision by destroying normal retinal vascularisation. The dangers of oxygen should be appreciated by all responsible for the care of premature infants. The exact amount that may be given with impunity is a matter for clinical investigation; but meanwhile it should be given only where necessary, and then in the smallest quantity and for the shortest time consistent with the infant's survival.

Observer Error

DURING the past ten years many tests have shown that considerable inconsistency and inaccuracy is to be expected in the reading of chest radiographs. For example, BIRKELO et al.[17] found that of five readers who attempted to select radiographs suggesting pulmonary tuberculosis from a largely normal group, none succeeded in selecting more than three-quarters of the abnormal films. Moreover, when the same films were read again after three months, a reader was likely to change his mind once in every five of the positive cases. Other tests, in Denmark,[18] showed a similar lack of consistency; and COCHRANE [19] found that when the same films were read by teams in England and America, the honours—or dishonour—were equally divided. A similar lack of consistency,

12. Szewczyk, T. S. *Amer. J. Ophthal.* 1953, **36**, 1336.
13. Campbell, K. *Med. J. Aust.* 1951, ii, 48.
14. Ryan, H. *Amer. J. Ophthal.* 1952, **35**, 329.
15. Patz, A., Hoeck, L. E., de la Cruz, E. *Ibid.* p. 1248.
16. Jefferson, E. *Arch. Dis. Childh.* 1952, **27**, 329.
17. Birkelo, C. C., Chamberlain, W. E., Phelps, P. S., Schools, P. E., Zacks, D., Yerushalmy, J. *J. Amer. med. Ass.* 1947, **133**, 359.
18. Groth-Petersen, E., Løvgreen, A., Thillemann, J. *Acta. tuberc. scand.* 1952, **26**, 13.
19. Cochrane, A. L., Garland, L. H. *Lancet*, 1952, ii, 505.

both between observers and in the same observer, was revealed by FLETCHER and OLDHAM[20] when they tested the ability of different observers to grade and classify cases of pneumoconiosis; this is perhaps less surprising, as any attempt to divide into arbitrary stages a process, such as this, which is essentially continuous is bound to prove difficult. More surprising—and serious—is the apparent impossibility of agreeing on changes in serial films of pulmonary tuberculosis. YERUSHALMY et al.[21] got six experienced readers to state whether a second film was unchanged, better, or worse. All six readers agreed over only two-thirds of the pairs; analysis showed that disagreement was not confined to films of poor technical quality, and that unilateral disease was as tricky to classify as bilateral. On re-reading the films, a reader was likely to disagree with his previous interpretation of the radiographic appearances once in about every five cases; and once in fourteen cases he would change his own reading of the second film from better to worse or vice versa.

Radiologists are easy to test, and so far it is usually their weaknesses that have been laid bare; but the clinician has no grounds for complacency. Even in a simple examination of the chest clinicians show the most remarkable variation in the frequency with which they elicit physical signs, as was made clear when eight experienced clinicians—all members or fellows of the Royal College of Physicians—examined the chests of twenty patients with emphysema.[22] Seeking the ordinary simple signs taught to students, they were unanimous in not a single instance; and most signs produced only a two-thirds agreement. This is not a great deal better than chance, and certainly does not promote confidence in physical examination. A similar lack of conformity has been found wherever it has been sought. Assessments of Mantoux tests, the general state of a child's nutrition, the redness of the throat, the condition of the tonsils, or the degree of cyanosis or anæmia have all revealed discrepancies—error is scarcely the right word—of about the same magnitude. Nor would it seem that clinicians are much more reliable when taking histories. COCHRANE et al.[23] found that the history recorded is very liable to be biased by the attitude of the recorder, and that answers to even the simplest questions are not always reproducible.

Of the radiological tests, it may be fairly argued that under normal working conditions the consistency might be far greater; some of the trials have been played to rules which call for decisions a radiologist would never make in practice. It would be interesting to compare the results with those of an experiment made in the course of routine work, and involving only routine decisions. Surprisingly the variability is independent of the size of film used. BIRKELO et al.[17] proved conclusively that for selecting cases in need of further investigation a full-sized film was no more reliable than 35-mm. photofluorography; individual errors swamped any advantage accruing from different techniques. Disagreement probably arises commonly over very small (and perhaps insignificant) shadows; but this is certainly not the whole story, for ZWERLING et al.[24] found that as many active and sputum-positive cases may be overlooked as cases considered on full investigation to be inactive. Observer trials may give an unduly gloomy picture, but there is no doubt that there must always be considerable variation between isolated subjective assessments, no matter what the field or how apparently simple the decisions.

These are the hard facts; what is their practical significance? In general medicine probably very small; action seldom follows on the result of a single observation, and the discussion, consultation, and re-examination that usually precede a final diagnosis or decision greatly reduce the hazard from this sort of error. But there are times when it is important. In mass-radiography surveys the films are read only once; and even though the greatest possible care be taken, it is inevitable that some patients will be given a clean bill of health to which they are not entitled. Their number (which may amount to 30% of all positive cases) can be significantly reduced if the films are read again by a second, independent observer. YERUSHALMY et al.[25] showed that such re-reading might reveal 30% of the missed positive cases at the cost of recalling a small number of people who proved to be free from disease. A prima-facie case has been made for double-checking of the films in all mass-radiography surveys; the greater efficiency in case-finding would surely justify the increased trouble and expense. Similarly, in other case-finding surveys and in therapy trials depending largely or wholly on the interpretation of radiographs by any of several observers, some method of multiple reading should be adopted to avert inter-individual variation, which may seriously impair the results. Even in the routine care of tuberculous patients, change in the radiographic appearance may be the chief factor in deciding treatment; and when this is so—unless the alteration is very obvious—it is best to seek a second opinion. It is astonishing how widely interpretations may vary; and anyone who fancies that this applies only to his colleagues should be urged to participate in an observer-error test as a chastening experience.

New Year Honours

THE three new knighthoods for members of the medical and dental professions in this country are conferred on Prof. E. C. Dodds, F.R.S., Dr. F. T. Rees, and Dr. E. W. Fish. The many contributions of Dr. Dodds to medicine include the synthesis of various new œstrogens (notably stilbœstrol), the inspiring directorship of a great institute since 1925, and help in many branches of research. By way of relief from life on the outermost fringes of new knowledge, he has served as master of the Society of Apothecaries and is now Harveian librarian of the College of Physicians; and he has succeeded in forming a unique compound which happily combines the flavours of the 18th and late 20th centuries. Dr. Rees, who served the Ministry of Pensions from 1919 until his recent retirement as director-general of medical services, won early distinction in the first world war and later did valuable work as a senior officer of Territorials. Dr. Fish, before becoming chairman of the Dental Board, was renowned for his investigations, and his often usefully unorthodox opinions, on paradontal disease, full denture prostheses, and other dental subjects; and he was president of the International Dental Congress in 1952.

To these and the other doctors whose names appear on p. 97 we offer warm congratulations.

20. Fletcher, C. M., Oldham, P. D. *Brit. J. industr. Med.* 1949, **6**, 168.
21. Yerushalmy, J., Garland, L. H., Harkness, J. T., Hinshaw, H. C., Miller, E. R., Shipman, S. J., Zwerling, H. B. *Amer. Rev. Tuberc.* 1951, **64**, 225.
22. Fletcher, C. M. *Proc. R. Soc. Med.* 1952, **45**, 576.
23. Cochrane, A. L., Chapman, P. J., Oldham, P. D. *Lancet*, 1951, i, 1007.
24. Zwerling, H. B., Miller, E. R., Harkness, J. T., Yerushalmy, J. *Amer. Rev. Tuberc.* 1951, **64**, 249.
25. Yerushalmy, J., Harkness, J. T., Cope, J. H., Kennedy, B. R. *Ibid*, 1950, **61**, 443.

Annotations

BRITISH PSYCHIATRY

"COMPLACENCY and condescension—these are not agreeable attitudes," Prof. Aubrey Lewis remarks,[1] warning us against taking it for granted that the modern practice of psychiatry is an improvement on the old. But all the same, and even after a pause for reflection, he can detect advances, here as in other countries. In reviewing, for Americans, the present position of British psychiatry, he is able to put in a good word for the Welfare State. Reformers, radical and conservative alike, he says, approve the betterment it has brought in many social services (including the health services), in the lessening of social stresses, and in the growth of rehabilitation and outpatient clinics. The mental hospitals, which used to be cut off from general medicine and from society, now penetrate both, and "the gulf between their doctors and the consultants in private practice or on the staff of the teaching hospitals has been filled in and carries a lot of traffic in both directions." Both groups provide domiciliary service at the request of the family doctor. Many of the defects of the present mental-health service—prejudices, diversity of outlook and practice, lack of enough suitable staff, ancient unsuitable buildings, and scarcity of materials—may reasonably be regarded as temporary. He rightly puts the shortage of mental nurses at the head of our list of serious immediate problems.

Psychiatric services for children have expanded greatly in this country, but not enough to meet all the demands on them. Child guidance has suffered, he says, by being kept distinct, "administratively, educationally and in orientation," from the psychiatry of adults; and the differing views of magistrates, head teachers, social workers, and even doctors, mean that in some areas more children are referred to the clinics than need be, in other areas fewer. The university departments of psychiatry are gaining in influence, and the number of chairs has quadrupled since before the late war. It follows that undergraduate instruction in psychiatry has improved; but the amount of time given to it in the curriculum varies from school to school, and very few teachers consider it their business to prepare the medical student for an era of great changes in psychiatry. In London there are, of course, special opportunities for postgraduate education; and psychiatric activity outside London grows and flourishes, especially in universities and teaching hospitals. Professor Lewis notes particularly the change in the medical hierarchy of mental hospitals since the advent of the National Health Service: the medical superintendent now "tends more and more to be engaged in clinical work on the same footing as his senior colleagues, and the influence he exerts on them derives less from his office than from his character and ability." The medical community in the mental hospital, in fact, is less nicely graded than it was. There are now two strata—one composed of members of the permanent senior staff, all on an equal footing, and the other consisting of junior staff in training, or of men of modest competence in the specialty.

Psycho-analysis, he remarks, is less in the ascendant here than in the United States. Indeed—whether for good or ill—none of the recognised teachers of psychiatry in the undergraduate medical schools of London is a member of the British Psycho-Analytical Society. However, in the Institute of Psychiatry at the Maudsley Hospital—the largest postgraduate psychiatric training centre in the country—a fifth of the senior medical staff belong to the Psycho-Analytical Society, and the Jungian view is also represented among them. Such diversity is in keeping with the policy of the institute, where "responsible proponents of diverse views state them fairly and without heat . . . and the pupils are free to listen, weigh, accept, reject, or modify and assimilate."

Professor Lewis traces much of the present trend of psychiatry in Britain to the influence of Henry Maudsley. The five main departments of the Institute of Psychiatry—in clinical psychiatry, psychology, neurophysiology, biochemistry, and pathology—"fairly reflect his idea of how the study of mental states must be pursued and nourished within a university and applied within a hospital." But the temper of Maudsley's mind—"critical, distrustful of elaborate speculation, sceptical, candid and tough"—is not, Professor Lewis regretfully admits, strongly manifest in English psychiatry today.

1. *Amer. J. Psychiat.* 1953, **110**, 401.

ENDEMIC SMALLPOX

A W.H.O. report [1] sets out, from the available recorded statistics for the years 1936–50, the endemic level of smallpox in different countries of the world; figures for China and Russia are not included. A simple index for judging the endemic level has been worked out for each country by averaging the attack and death rates for the five years of lowest incidence during the period. The endemicity-rate so calculated is admittedly crude, since it does not necessarily express continuous endemic levels. Moreover variola major and minor are not recorded separately. Nevertheless, where this endemicity-rate exceeds 1 per 100,000 inhabitants the method can be used for comparative purposes to demarcate zones and areas in which endemic foci existed during the period. By means of this yardstick, the highest endemic levels of smallpox were found in India and Pakistan, followed by Burma and Indochina. In the Americas, Venezuela, Brazil, Columbia, Bolivia, Peru, Paraguay, and Mexico, and in Europe, Portugal had relatively high endemicity-rates. A separate study for seaports and airports showed the highest endemicity-rates in Calcutta, followed by Delhi and Bombay; all the major ports in India had higher rates than those for any other country. Attention is thus focused on areas where concerted measures directed at the eradication of smallpox might materially reduce the incidence of smallpox throughout the world.

MOLLUSCUM PSEUDOCARCINOMATOSUM

A few months ago [2] we described under this name the molluscum sebaceum—a lesion only recently recognised but of considerable importance because a substantial proportion of cases hitherto diagnosed and treated as squamous carcinoma of the skin seem in fact to be examples of this benign and self-healing condition. We remarked that accounts of it were confined to the British Isles. Since then, however, French descriptions [3 4] of obviously similar lesions have come to our notice, and new reports add further information.

Dr. Stewart [5] has seen at least 27 cases in Christchurch, New Zealand; and he supports Beare's [6] estimate that roughly a third of the cases of "squamous carcinomas" are really of this nature. Marshall and Findlay [7] describe from Pretoria, South Africa, a single case of that "multiple primary self-healing squamous carcinoma" which is now usually regarded as a multiple form of molluscum sebaceum. The condition may be as common in France and South Africa as in this country; but Purdy [8] has formed the impression that it is less common in New Zealand than in this country where he has previously studied the disorder.[9] The geographical distribution of the lesion is at present of that peculiar sort in which notification of cases follows the routes of

1. *Epidem. vit. Stat. Rep.* 1953, **6**, 227.
2. *Lancet*, 1953, ii, 816.
3. Dupont, A. *Bull. Soc. franç. Derm. Syph.* 1952, **59**, 340.
4. Civatte, A., Melki, G. R., Goetschel, G. E. *Ibid*, 1950, **58**, 53.
5. Stewart, D. T. *Lancet*, 1953, ii, 1096.
6. Beare, J. M. *Brit. J. Surg.* 1953, **61**, 167.
7. Marshall, J., Findlay, G. H. *S.Afr. med. J.* 1953, **27**, 1000.
8. Purdy, M. J. *Lancet*, Jan. 2, 1954, p. 51.
9. Purdy, M. J. *N.Z. med. J.* 1953, **52**, 191.

dissemination of postgraduate students and medical journals.

Dr. Halnan [10] believes that these lesions should be treated as radically as though they were carcinomatous. There is reason to think, however, that a genuine squamous carcinoma of the skin will not in fact be cured by local excision or by light irradiation, while the alternatives of radical excision or full irradiation would be gross over-treatment for a benign lesion, situated as this often is in such critical places as the eyelid or nares. It rests with clinician and pathologist to gain the experience by which they can confidently distinguish the two types. Until they can do this the best course is local excision of the whole lesion: if then the diagnosis is proved wrong, little will have been lost. Dr. Beare, in a letter which we publish this week, favours no more than the removal of the top of the tumour, followed by cauterisation of the wound.

Ability to detect malignancy is often regarded as the sine qua non of a good pathologist. But it requires still greater diagnostic skill, and it is no less rewarding, to save a patient with a benign lesion from the discomforts, anxieties, and dangers of treatment for cancer.

TWO HANDICAPS

EPILEPTICS and patients with cerebral palsy, though their disabilities are very different, are both apt to disquiet other people. Because of this, they often find it difficult to live as normally in society as their actual abilities would permit. The Ministry of Health Advisory Council for the Welfare of Handicapped Persons have lately issued to local authorities reports [11] from their committee on the development of welfare services for handicapped persons, dealing with the special needs of these two classes of patients.

The report dealing with epileptics emphasises again that for the patient himself a fit is a brief harmless explosion without much significance; and the committee feel that teachers should be encouraged by propaganda to accept an epileptic child's life coolly and to teach the other children in his class to do the same. Indeed a fit in school, as we have said elsewhere,[12] can be used to teach children the value of calmness in the face of a medical emergency. But if the epileptic child is to be accepted at his proper value, his schoolmates must learn something more than this. Any child who is at all odd is liable to be ostracised by his fellows unless they can be given an imaginative insight into the reasons for his oddness; and only a teacher who has that insight can pass it on. Some teachers, it seems, are so frightened and repelled by fits that they place difficulties in the way of an epileptic child's attendance at their school, even though he may be intellectually well up to the work. Something more personal than printed propaganda is needed to overcome their alarm: perhaps arrangements should be made for any teacher asked to accept an epileptic child to visit an epileptic colony. Perhaps, too, no school should ever take a solitary epileptic; if there is at least one other epileptic in his school a child is very much less likely to become odd-man-out among his contemporaries. The recommendation of the committee that whenever possible epileptic children should be educated in ordinary schools should make it easy to include more than one in any given school.

The number of epileptics in this country is uncertain, but the committee think there must be at least 100,000—about 20,000 of them being children under school-leaving age. Some 15,000 are registered under the Disabled Persons (Employment) Act of 1944, and nearly 1800 of these were unemployed in April, 1950. The prevalence of epilepsy in the population is probably at least 2 per 1000. Some epileptics are mentally defective from birth and some deteriorate mentally during their lives; at present these groups account perhaps for 13,000 in all. But of course most epileptics are normal mentally, and there is nothing to prevent them living normal lives except the prejudices of other people. Those substantially and permanently handicapped are looked after in residential epileptic colonies or attend special schools. As welfare services develop it may be possible to release from colonies many who must now remain there; and this might be offset, the committee say, by allowing colonies to admit for treatment and raining epileptics who are less seriously handicapped. Only two-thirds of the children needing education in a special school have places at such schools at present.

The commonness of infantile convulsions makes accurate diagnosis of epilepsy difficult in the first four years of life, but the committee note the results of an American survey, which showed that the incidence of infantile convulsions is 5 times greater in epileptic than in unselected children, and that among epileptic children those with a family history of epilepsy show 8 times as many infantile convulsions as those without such a family history. They suggest that general practitioners should bring to the notice of the school medical officer all epileptic children and all those suspected of epilepsy, as soon as possible after they reach the age of two. In doubtful cases the diagnostic facilities of the hospitals should be called upon, and probably every epileptic child should be seen at such a diagnostic department at least once. The child's mental ability should be determined as early as possible, so that if he needs special education arrangements can be made to give it him; and there should be continuous and close liaison between the officers of the various services under which the child is to be treated. More places are needed in special schools, and we could do with one or two schools for epileptic children with other handicaps. At school-leaving age children should be reassessed to see whether or not they are going to be employable. The school doctor, with the help of the hospital and the local-authority health and welfare officers, should be made responsible for seeing that this is done. The committee propose that local authorities providing aftercare and welfare services, and those managing colonies belonging to voluntary bodies, should coöperate closely; such a linkage might lead to a two-way traffic. Colonies might also, with advantage, be reclassified to meet known needs. Hostels are required for epileptics ready to try their capacity for employment in industry but still needing some care. A comprehensive welfare service should also provide opportunities for sheltered employment, lists of suitable lodgings, and occupational activities for those unfitted for the open market. Local-authority officers, the committee finally say, might take a greater part in helping epileptics through their employment difficulties.

Their recommendations about patients with cerebral palsy (grouped here under the misleading label of "spastics") follow similar lines: they are anxious that adequate welfare services should be provided for the fully developed case, and that treatment should be assured as soon as the condition is diagnosed. They underline the importance of testing carefully the intelligence of children suffering from this condition. Many of them are normal mentally; but some of these still find their way into mental-deficiency institutions merely because their disability has masked their intelligence. The committee suggest that whenever possible patients with cerebral palsy should be given the chance to train for an industrial occupation, and should not be rejected as untrainable without a reasonable period of trial. The less severely handicapped adolescents might be admitted to residential units set up for the purpose, where they would receive any necessary treatment and further education, and from which they could attend training

10. Halnan, K. E. *Lancet*, 1953, ii, 1358.
11. Circular 26/53.
12. *Lancet*, 1953, ii, 387.

centres or go out to work, returning each night. An experimental unit of the kind might, the committee think, be established by a voluntary organisation supported by the statutory bodies sending in cases. For the more severely handicapped adolescents and adults, some of whom are now in wards for the chronic sick, local authorities might combine to establish residential homes where they could have some form of occupation. Local authorities should also combine with parents' associations and with voluntary organisations, and in particular should help in instructing parents in the management of the disorder of voluntary movement which cerebral palsy causes. These various approaches to the problem, in the committee's opinion, might be encouraged by temporary Exchequer grants to local authorities.

The report does not discuss the criteria on which very early diagnosis of cerebral palsy may be based [13]; nor does it mention the attempts being made, notably at Queen Mary's Hospital, Carshalton,[14] to train intelligent palsied children in normal movement from a very early age, in the expectation (already fulfilled in some cases) that by the time they reach school age they will be fit for an ordinary school.

RHEUMATISM REVIEW

To review a quinquennium's output of papers dealing with the diverse topics which fall within the broad and ill-defined field of "rheumatism" is no mean task, and its recent accomplishment by a committee of twelve United States physicians [15] is an impressive example of transatlantic industry and organisation. The American Rheumatism Association's team, headed by Dr. William D. Robinson, has addressed itself to the years 1946–50 and to a total of 2256 papers culled from the medical journals of the United States and Britain. The result of its labours makes rather a full evening's reading, but as a guide to the literature it will be no less welcome than its nine predecessors. In controversial matters the editors come to the reader's help with a brief but authoritative summing-up, though at times a medley of divergent views inevitably refuses to crystallise into any firm conclusion.

Disorders of the locomotor system pose many problems in differential diagnosis; and it is useful to bring together information about conditions which tend to be separated into the provinces of orthopædic surgery, "rheumatology," general medicine, and even dermatology. The reviewers deal fully with major problems, such as rheumatoid arthritis, but do not fail to give attention to such hazards as the calcareous peritendinitis of the peroneal tendons which may afflict house-painters who habitually use narrow-rung ladders. The greatest development in the years reviewed was, of course, the introduction of cortisone and corticotrophin and the resulting intensified interest in pituitary and adrenal function. But there were other developments; and such things as the unifying concept of "reflex sympathetic dystrophy," the rôle of the Coxsackie group of viruses in epidemic myalgia, and the discovery of the "lupus erythematosus cell" phenomenon receive due attention. It is useful, too, to be reminded of the various infective conditions (brucellosis, for example) in which arthralgia or true arthritis may be prominent.

The difficulty of assessing the value of slowly acting methods of treatment in a disease as unpredictable as rheumatoid arthritis is again emphasised by the section dealing with gold therapy. The current score of 7000 reported cases treated with gold still leads to the rueful verdict that the exact value of this therapy is still undetermined. The majority verdict that it has a favourable influence, at any rate as regards the short-term outcome, is still questioned by a few staunch sceptics. The efficacy of attempts to avoid relapses by "maintenance" treatment after the end of an orthodox course of gold is also regarded as unproved. The dangers of chrysotherapy are well reviewed; and the value of dimercaprol (BAL) and of corticotrophin or cortisone in dealing with toxic reactions is considered—the hormones are perhaps particularly indicated in thrombocytopenia and dermatitis.

The term "collagen disease" is regarded as serving a useful purpose at present (though some would prefer "connective-tissue disease"). The review cites the views of Baehr and Pollack, who emphasised the differences among the various conditions included in this group and concluded that fibrinoid degeneration is not sufficiently specific to be a reliable common denominator for the classification of disease, and that acceptance of an allergic basis for these diseases without other supporting evidence discourages other avenues of investigation into their essential nature. From the papers reviewed it seems that the evidence for "sensitisation" as a factor in ætiology is still strongest in the case of polyarteritis nodosa.

The section dealing with rheumatic fever contains further impressive evidence of the efficacy of small daily doses of a sulphonamide drug or of penicillin in reducing the incidence of recurrences, as well as some hopeful views on the possibility of preventing first attacks by prompt treatment with penicillin of streptococcal pharyngitis. Most workers agree that the incidence and severity of the disease are decreasing, but exact figures are lacking. Recognition that electrocardiographic abnormalities may arise in gonorrhœal arthritis raises a point in the differential diagnosis of this disease from rheumatic fever. Gonorrhœal arthritis, however, is a disappearing disease, which incidentally is now commoner in women than in men.

The principal limitation of a review as comprehensive as this is the inevitable lag between the end of the period which it covers and its publication; but this detracts little from its main importance as a work of reference.

BACTERIOPHAGE AND BACTERIAL CELL

BACTERIOPHAGES are able to differentiate between strains of the same bacterial species and this feature is used in the epidemiological study of many bacterial groups, particularly *Salmonella typhi* and staphylococci. The test is arbitrary in so far as we have no real knowledge of the mechanism controlling specificity, although it is related both to the absorption of phage and to the serological type of the bacterial host.

Working with a lytic phage which is active on a type of *Shigella sonnei*, Jesaitis and Goebel [1] have shown exactly how somatic antigen of the bacteria controls the susceptibility to phage action. The lipocarbohydrate fraction of the somatic antigen was tested and found to be capable of inhibiting phage multiplication (a finding similar to that with many phages, except that it is on a quantitative basis); 2×10^{-16} g. of the complex was able to inhibit the adsorption of a single virus particle. The most interesting part of the work is, however, the observations made on the inactivated phage particles. The inactivation was shown by electron microscopy to lead to the release of desoxyribonucleic acid from the head of the phage, leaving behind a "ghost-like" shell of the phage similar to that produced by Anderson et al.[2] with osmotic shock. Chemical studies showed that 60% of the phage desoxyribonucleic acid was released by the action of the lipocarbohydrate.

If these observations are confirmed, then another step forward will have been made in our knowledge of how a bacterial cell becomes infected with bacteriophage.

13. Collis, E. *Ibid*, 1953, i, 416.
14. Collis, E. *Ibid*. 1953, ii, 757.
15. Rheumatism and Arthritis, Review of American and English Literature of Recent Years: Tenth Rheumatism Review. *Ann. intern. Med.* 1953, **39**, 498, 757.

1. Jesaitis, M. A., Goebel, W. F. *Nature, Lond.* 1953, **172**, 622.
2. Anderson, T. F., Rappaport, C., Muscatine, N. A. *Ann. Inst. Pasteur*, 1953, **84**, 5.

Special Articles

MYOCARDIAL INFARCTION AND ITS TREATMENT WITH ANTICOAGULANTS

SUMMARY OF FINDINGS IN 1031 CASES *

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IN 1946 the American Heart Association set up a committee to determine the value of anticoagulants in the treatment of myocardial infarction. Teams headed by outstanding cardiologists supervised controlled series in sixteen hospitals. Since the newer anticoagulants were not then available, dicoumarol was the principal anticoagulant used, supplemented occasionally in the initial stages by heparin. Cases admitted on odd days of the month were assigned to the group receiving anticoagulants (provided contra-indications were not present) and cases admitted on even days were assigned to the group receiving conventional therapy. Cases dying within twenty-four hours of admission were omitted. Observations were continued consistently for a six-week period and reported in detail to the Central Laboratory. On this basis, in the course of two years, a pooled series of 1031 hospital-treated cases of definitely diagnosed coronary thrombosis with myocardial infarction was accumulated.

A preliminary report, based on the first 800 cases, was published in 1948.[1] The full analysis of the total series, including a detailed study of the necropsy findings, is now nearing completion.[2]

Clinical Findings

THROMBO-EMBOLIC COMPLICATIONS

26% of the 442 control cases in the final series developed thrombo-embolic complications during the six-week period of observation, compared with only 11% of the 589 treated cases. The control group averaged 42 thrombo-embolic complications per 100 cases during the period studied, and the treated group only 13 complications per 100—less than a third. Both differences are highly significant statistically. The treated group had a substantially lower incidence of all types of thrombo-embolic complications, including venous thromboses and intracardiac complications (extensions and new secondary infarctions), but contrasts were particularly dramatic for cerebral, visceral, and peripheral emboli, which, when combined, showed rates in the treated group less than a sixth of those in the controls. Study of complications during comparable periods of the illness indicated that the differences were significant only during the periods when anticoagulants were in use.

Thrombo-embolic complications were in general commoner among the following types of patients: (1) those who were severely ill at onset; (2) those 10% or more overweight; (3) those in older age-groups; (4) those who had already developed one or more thrombo-embolic complications; (5) those who developed congestive heart-failure or shock after the initial period; and (6) those with auricular fibrillation or heart-block. Such patients are, therefore, particularly in need of anticoagulant therapy. Significant variations in risk were not associated with sex or site of infarction. The percentage reductions (compared with corresponding controls) remained remarkably consistent for the numerous subgroups studied. Moreover, no subgroup of reasonable size could be identified that showed, in the absence of anticoagulant therapy, less than 28 thrombo-embolic complications per 100 cases. In view of the potentially serious consequences of thrombo-embolic phenomena (as, for example, hemiplegia or a gangrenous leg), this level is considered sufficiently high to warrant the use of anticoagulant therapy for all cases, including mild ones, where positive contra-indications do not exist and adequately controlled anticoagulant therapy is feasible.

DEATHS

In myocardial infarction there are many causes of death besides thrombo-embolic complications—for example congestive heart-failure, shock, and rupture of the heart. Hence the substantial reductions in thrombo-embolic complications did not reduce the fatality-rate correspondingly. Of the 442 patients in the control group, 23·4% died within six weeks, compared with 16·0% of the 589 in the treated group. 42% of the control-group deaths but only 23% of the treated-group deaths were preceded by a clinically diagnosed thrombo-embolic complication. During the period of potentially effective anticoagulant therapy—i.e., from the fourth day of therapy until four days after the last dose of dicoumarol—only 9·5% of the treated-group cases died, or only slightly more than half the figure of 17·4% for control-group deaths during the corresponding period of their illness—a statistically significant difference. In contrast, differences during unprotected periods were minor and insignificant.

The risk of death was found particularly high for the following types of patients: (1) those aged 60 and over; (2) those 10% or more overweight; (3) those with a history of congestive heart-failure, diabetes, arteriosclerosis, or hypertension; (4) those showing persistent congestive heart-failure or shock or definite uræmia; and (5) those who developed a thrombo-embolic complication during their illness. When patients were characterised by their status during the initial period or the first week, the following types showed a poor prognosis; (1) those regarded initially as severely ill or as poor-risk cases; (2) those showing certain abnormal rhythms, particularly auricular fibrillation and heart-block; (3) those with leucocyte-counts of 20,000 per c.mm. or more; (4) those with rectal temperatures of 103° F. or more; (5) those showing a drop of either 60 mm. Hg systolic or 40 mm. diastolic or more below their usual blood-pressure level; and (6) those with a maximum pulse-rate of 120 or more. Many patients showed more than one of these unfavourable prognostic signs. After standardisation for age, the following showed no conspicuous or statistically significant association with a high mortality: sex; site of infarction; or a history of coronary-artery disease or of anginal syndrome.

In comparison with the findings for thrombo-embolic complications, reductions in deaths associated with anticoagulant therapy were less consistent percentage-wise and less dramatic. With infrequent, minor, and insignificant exceptions, however, when subclasses were compared they reflected some margin of saving. Reductions in deaths in the treated group were particularly notable for patients (1) 10% or more overweight, (2) with diabetes, (3) with auricular fibrillation in the first week,

* Summary of a report by the Committee on Anticoagulants of the American Heart Association. The full report is appearing in the January issue of the association's leaflet publication *Modern Concepts*. The opinions and conclusions do not necessarily represent the official view of the scientific council of the American Heart Association.

1. Wright, I. S., Marple, C. D., Beck, D. F. *Amer. Heart J.* 1948, **36**, 801.
2. Wright, I. S., Marple, C. D., Beck, D. F. *Myocardial Infarction: a Study of 1031 Cases: its Clinical Manifestations and Treatment with Anticoagulants*. To be published by Grune & Stratton, New York.

or (4) 60 years of age and over. Certain other types of patients severely threatened by their attack showed hardly any improvement in fatality-rates in spite of a substantially improved record for thrombo-embolic complications. For many of these patients, a fatal termination was doubtless inevitable, with or without anticoagulant therapy.

The findings do not support the policy, recommended by some, of treating only patients appearing severely ill at onset, deferring anticoagulant treatment in milder cases until complications occur. When the findings for complications and deaths were considered jointly, they failed to reveal any group that, in the absence of contra-indications, should be excluded from anticoagulant therapy on the grounds that no potential benefits can be expected. Those mildly or moderately ill showed a death-rate of 14% in the control group compared with 7% in the treated group. When good-risk cases (classified by multiple criteria, approximating those of Russek et al.[3]), were separately considered, the proportion dying was below 2% in both groups, nevertheless, thrombo-embolic complications in these same cases remained at the high level of 29% in the control group as contrasted with 9% in the treated group.

CONFIRMATION OF FINDINGS ON COMPLICATIONS AND DEATHS

The major differences, as regards deaths and thrombo-embolic complications, between the cases treated with and without anticoagulants were not only maintained consistently as the study progressed but have been confirmed by numerous other studies. A further series of the American Heart Association, which compared the effects of dicoumarol and ethyl biscoumacetate ('Tromexan'),[4] showed that additional myocardial-infarction cases treated with anticoagulants had, like those in the earlier dicoumarol series, low fatality and thrombo-embolism rates. Similar confirmation has been furnished by Smith and his co-workers [5] at Henry Ford Hospital, Detroit, by Vander Veer, Marshall, and Kuo [6] at the Pennsylvania Hospital; by Peters, Doenges, and Brambel [7] at Mercy Hospital, Baltimore; by Greisman and Marcus [8] at Lincoln Hospital, New York; by Schilling [9] at St. Luke's Hospital, New York; by Mullins and his co-workers [10] at Mercy Hospital, Pittsburgh; by Manchester [11] in Washington, D.C.; by Rashkoff and his co-workers [12] at Mount Sinai Hospital, New York; by Tulloch and Gilchrist [13] in Edinburgh, and most recently by Loudon, Pease, and Cooke [14] at the Radcliffe Infirmary, Oxford. Numerous other physicians, among them such pioneers as Nichols of Miami, have also contributed substantially through their early clinical trials of anticoagulant therapy in myocardial infarction. Though a few workers have not found anticoagulants valuable, these exceptions may be attributed to the use of the retrospective records not made with this problem in mind, to chance fluctuations in small samples, to the selection for treatment of the more severe cases, or to suboptimal therapy. When all available evidence is considered, the better outcome of the treated cases cannot reasonably be attributed to chance.

HÆMORRHAGES

Use of anticoagulants was associated with an increase in bleeding observed clinically (13% in the treated group against 5% in the controls). The principal types were hæmaturia, hæmatemesis, melæna, hæmoptysis, and epistaxis. Bleeding believed due to, or aggravated by, anticoagulants averaged 9 episodes per 100 cases in the treated group; bleeding due to other causes was of equal frequency in the two groups. More than half the episodes related to anticoagulants were mild in nature (principally microscopic hæmaturia); two-fifths were moderate; only 4 episodes were severe, and none observed clinically was fatal. Bleeding was more frequent, regardless of treatment, in the presence of azotæmia and renal and hepatic disease; but even among these patients, more than two-thirds escaped without bleeding during therapy.

OTHER CONSEQUENCES OF ANTICOAGULANT THERAPY

Careful study of the course of the illness failed to reveal any unfavourable consequences of anticoagulant therapy other than hæmorrhage. In general, the illness seemed to be favourably affected. Cases which the attending physician classified as severe at the onset but moderate or mild later, were considerably more numerous in the treated group than in the controls; and, contrariwise, the proportion judged mild or moderate at onset but severe later was nearly twice as great in the control as in the treated group. During later weeks of the illness various specific conditions were less common in the treated than in the control group—notably, new congestive heart-failure and shock.

FINDINGS PERTINENT TO TREATMENT PROCEDURES

An analysis of thrombo-embolic complications in relation to specific prothrombin-times showed that while some therapeutic effect was evident with minor prolongations, the lowest incidence of thrombo-embolic complications was not achieved until prothrombin-times were prolonged to at least 25–39 seconds. Prolongation beyond this range yielded no additional advantage. Since the incidence of hæmorrhage was found to increase rapidly as times were prolonged beyond 39 seconds, it was concluded that 25–39 seconds † (23–11% prothrombin activity) was the optimum therapeutic range for anticoagulant therapy. In addition, the findings regarding early complications underscored the need for achieving this therapeutic range rapidly. Heparin and/or tromexan have been helpful for this purpose. Since, in the absence of anticoagulant therapy, both thrombo-embolic complications and deaths were found to be most frequent during the fourth week of the illness, four weeks should be considered the minimum period for such therapy unless bleeding occurs. When thrombo-embolic complications have intervened, a longer period of therapy is indicated. The techniques for administering dicoumarol, tromexan, and heparin, and for the necessary laboratory tests, are described by Wright.[15]

Anticoagulants should be used cautiously, or not at all, in the following conditions: (1) prothrombin deficiency (hypoprothrombinæmia), found with vitamin-K deficiency or severe hepatic disease; (2) vitamin-C deficiency; (3) renal insufficiency; (4) blood dyscrasias with impairment of normal mechanisms for hæmostasis; (5) late pregnancy; (6) subacute bacterial endocarditis; (7) ulcerations and open wounds; (8) recent surgical operations on the brain or spinal cord; (9) operations performed in the presence of obstructive jaundice, external

3. Russek, H. I., Zohnman, B. L., Doerner, A. A., Russek, A. S., White, L. G. *Circulation*, 1952, **5**, 707.
4. Scarrone, L. A., Beck, D. F., Wright, I. S. *Ibid.* 1952, **6**, 489.
5. Smith, F. J., Keyes, J. W., Denham, R. M. *Amer. J. med. Sci.* 1951, **221**, 508.
6. Vander Veer, J. B., Marshall, D. S., Kuo, P. T. *Trans. Coll. Physns Philad.* 1948, **16**, 67.
7. Peters, H. R., Doenges, J. P., Brambel, C. R. *Sth. med. J.* **41**, 526.
8. Greisman, H., Marcus, R. M. *Amer. Heart J.* 1948, **36**, 600.
9. Schilling, F. J. *J. Amer. med. Ass.* 1950, **143**, 785.
10. Mullins, W. L., Helz, M. K., Purvis, J. D., Bailey, W. R., Keister, S. R. *Penn. med. J.* 1950, **53**, 245.
11. Manchester, B., Rabkin, B. Programme, 26th scientific sessions, American Heart Association, April 9–12, 1953, p. 38.
12. Rashkoff, I. A., Schaefer, L. E., Magida, M. G., Levy, H. *J. Mt Sinai Hosp.* 1952, **18**, 350.
13. Tulloch, J. A., Gilchrist, A. R. *Brit. med. J.* 1950, ii, 965.
14. Loudon, I. S. L., Pease, J. C., Cooke, A. M. *Ibid*, 1953, i, 911.

† For clinical purposes 2–2½ times the control prothrombin-time is satisfactory if the control time is 12–18 seconds.

15. Wright, I. S. The Pathogenesis and Treatment of Thrombosis. New York, 1952; p. 54.

biliary fistula, or severe liver damage; (10) operations leaving raw surfaces; (11) postoperative tube drainage of wounds or viscera; and (12) dissecting aortic aneurysm.

When hæmorrhage occurs during the administration of coumarin compounds—as will occasionally happen in spite of these precautions—it should be treated by withholding anticoagulants and giving 60–72 mg. water-soluble vitamin K once or twice. If bleeding is severe, give 250–500 mg. vitamin K_1 oxide orally, followed, if necessary, by 300–500 ml. of fresh whole blood or plasma. If hæmorrhage occurs during the use of heparin as the sole anticoagulant, discontinue its use and if necessary give whole-blood transfusions. Vitamin-K preparations are not indicated unless the prothrombin-time is prolonged. If cardiac tamponade appears to be developing under anticoagulant therapy, pericardial puncture and drainage should be used.

GENERAL CHARACTERISTICS OF PATIENTS

Of the 1031 patients, about half had a history of coronary-artery disease; about a quarter had had a previous infarction; 4 in 10 had a history of hypertension; about a quarter had an elevated serum-cholesterol level; and 11% had a history of diabetes (a very high proportion in comparison with the figure of about 1–5% for the general population). The group as a whole was not characterised by overweight although the outcome was less favourable in overweight cases. Significant polycythæmia was not found characteristic. The women were on the average about 6 years older than the men, and, even after correction for age, a substantially higher proportion of them had a history of diabetes (22% against 7%) and a history of hypertension (64% against 38%).

COMPARABILITY OF THE TREATMENT GROUPS

Comparison of the control and treated groups with respect to numerous features before and soon after the onset of the attack showed them to be remarkably similar. With very minor exceptions, differences noted were small, well balanced in the direction of their probable influence on outcome, and not statistically significant. As an additional test, the control and treated groups were rated for comparability applying Schnur's pathological index rating or P.I.R.[16] On this rating the control group averaged 44 and the treated group 43—again a very minor and obviously insignificant difference for this index and one that could not explain the observed difference in deaths and complications.‡ Thus, while there were occasional exceptions to the selection of cases for treatment according to whether the day of the month was odd or even, these do not seem to have destroyed the comparability of the two groups as ultimately analysed. For certain of the exceptions it was possible to make statistical corrections. The final report will support in detail the conclusion that the use of anticoagulant therapy offers the only plausible explanation for the substantial and consistent pattern of outcomes favourable to the treated group.

Necropsy Findings

91% of the cases in this series were examined post mortem. The diagnosis of acute myocardial infarction was found correct in 98% of the cases, the 2% of erroneous diagnoses being made in cases with evidence of old myocardial infarctions. Both the presence and the situation of the infarct were correctly diagnosed in 87% of the necropsy cases. Nearly three-quarters of the original infarctions were found due to thrombotic occlusions. Only 3% were due to subintimal hæmorrhage, the remaining 25% being due to coronary insufficiency without occlusion, or to miscellaneous causes. Severe arteriosclerosis was evident in the coronary arteries in 88% of the cases examined post mortem; in the aorta in 54%; in the cerebral vessels in 24%; in the renal arteries in 12%; and in the pulmonary arteries in 7% of the cases with corresponding organs examined.

THROMBO-EMBOLIC COMPLICATIONS

Even though many of the necropsy cases died early, frequently preventing the treated cases from receiving a significant period of adequate anticoagulant therapy, two-thirds of the untreated cases but only a third of the treated necropsy cases showed mural thrombi. Treated cases that did show mural thrombi had fewer chambers of the heart involved than did untreated cases. Extracardiac thrombo-embolic complications (emboli, infarctions, or thrombi) average 125 per 100 among untreated cases but only 45 per 100 among treated cases. These involved, in descending order of frequency, the lungs, kidneys, aorta, brain, spleen, liver, and adrenal glands. Only 13% of these extracardiac complications had been diagnosed clinically. Undiagnosed thrombo-embolic phenomena were much more often found at necropsy in untreated than in treated cases—a fact that implies that the clinical findings on complications understate the degree of contrast that prevailed.

HÆMORRHAGES AND RUPTURES

52% of the untreated cases as compared with 66% of the treated cases showed some degree or type of intracardiac hæmorrhage (other than rupture) on gross examination, and an additional 11% and 20% respectively showed microscopic hæmorrhage. While this contrast is based on a small sample and tends also to be exaggerated by the fact that the number of treated cases coming to necropsy with thrombo-embolic phenomena is reduced by anticoagulant therapy, some of this difference in prevalence of hæmorrhage is undoubtedly due to anticoagulants. Since counts include very minor hæmorrhages, not all the difference reflects bleeding of significance to the patient. The high rate among untreated cases indicates, moreover, that bleeding is a common characteristic of myocardial infarction as of infarction in other sites. Cardiac ruptures number 4 among the 48 untreated necropsy cases and 8 among the 41 treated necropsy cases with myocardial infarction. No increase in subintimal hæmorrhage of the coronary arteries was found associated with therapy.

Extracardiac hæmorrhage was relatively uncommon in both groups. 17% of the untreated group, and 20% of the treated, showed some extracardiac hæmorrhage on gross necropsy examination. These involved 2% and 2·7% respectively of the organs examined. None outside the heart contributed to death.

An evaluation of the rôle of hæmorrhage and rupture in the deaths of the patients, plus the use of the assumption that the causes of death in fatal cases not examined post mortem were proportionately similar, led to the estimate that in 2·4% of all untreated cases and 4·1% of all treated cases rupture or hæmorrhage (mostly hæmopericardium) was an immediate or contributing cause of death. If this difference is typical and not due to chance, it may be inferred that anticoagulants will themselves be responsible for the death of 1·7% of the patients who die during their use. In our series this risk was heavily outweighed by the reduction in deaths with thrombo-embolism, as the substantially lower total net death-rate for treated cases makes evident.

While some contend that this risk of causing hæmorrhage is unjustified for patients only mildly ill (good-

16. Schnur, S. *Circulation*, 1953, **7**, 855.

‡ It should be noted that the use of this index does not imply its endorsement. The P.I.R. has obvious shortcomings, such as the inclusion of unimportant criteria, the omission of important criteria, the lack of objective justification for the weights used, and its complete dependence on the accuracy, fullness, and comparability of the reporting of the patient's history and condition on admission.

risk cases), whose total death-rate may not exceed 2%, this argument fails to take into account the probability that the risk of death from rupture of the heart or from hæmopericardium is also directly correlated with the severity of the case and with the general risk of death; for a large infarct, the presence of hypertension and pericarditis, and poor condition of the heart all clearly increase the risk of both rupture and hæmopericardium. If this is true, the probability that a *good-risk case* will die from hæmorrhage or rupture of the heart will be considerably below the general estimated 1·7% level. Evidence from the present series supports this statement. Of the 16 cases in the present series (both groups) in which hæmorrhage or cardiac rupture was an immediate or contributing cause of death, all except 1 were poor-risk cases by Russek's criteria.[3] With improved classification, this 1 case would also have been considered a poor-risk case, since the patient (a woman of 84 with cardiac rupture) had a large infarction, was hypertensive, and was classified as severely ill at onset. She did not happen, however, to show any of Russek's signs distinguishing poor-risk cases.

Thus it seems highly improbable that the *net* risk of death (i.e., savings balanced against losses) would be increased on the average by the use of anticoagulant therapy in good-risk cases, *provided* that the patients were well screened for contra-indications and that such therapy was properly controlled. In view of the protection afforded against disabling and possibly fatal thrombo-embolic complications, the small additional hæmorrhage risk which anticoagulant therapy involves for these good-risk patients seems justified.

Conclusions

The evidence from this controlled case-material indicates that, in cases of myocardial infarction that survive the initial impact of the attack, anticoagulants, correctly used, help to prevent both thrombo-embolic complications and deaths.

The risk of their causing hæmorrhage is not excessive and is reduced as the physician gains experience.

The therapy is not one for the careless, or for the physician who does not fully understand the objective, methods, and contra-indications of the technique. On the other hand, hundreds of physicians, in many countries, have amply demonstrated that the technique can be mastered and used successfully.

Since there is real danger to the patient in waiting for the course to worsen or the first thrombo-embolic complication to develop before using anticoagulants, this therapy should not be reserved for patients severely ill at onset.

TREATMENT OF CATARACT AND GLAUCOMA

THE Ministry of Health [1] is asking hospital authorities "as a matter of urgency to review their arrangements for the treatment, and especially for the surgical treatment, of ophthalmological patients." Between 1950 and 1952 the number of hospital beds allocated to ophthalmology increased from 3975 to 4391, and there was a more than commensurate increase in the number of patients treated. During the same period, however, the waiting-list increased by more than 6000 to a total exceeding 31,000. "The position may well be that in some areas the waiting period for the operation for cataract is so long that the patient (who will very often be an old person) may die or become unfit to undergo the operation while waiting his turn for admission."

As regards glaucoma the position is rather different. Of the patients with this disorder who were registered as blind during 1951–52, some 33% had received no treatment at all; but the chief need here, says the Ministry, seems to be for improved early diagnosis, perhaps through special glaucoma clinics in ophthalmological departments. At present early diagnosis seems to be all too infrequent, although it is in the early stages of the disorder that the chance of success in treatment is greatest.

The Ministry cites a further analysis by Prof. Arnold Sorsby, following his report on the Causes of Blindness.[2] In 1951–52, 27·4% of the people who were registered as blind had cataract and a further 14·3% had glaucoma. "This means in round figures that some 3000 people lost their sight during the year because of cataract and 1500 because of glaucoma; and the numbers suffering from these conditions are likely to increase as the number of elderly people in the community becomes greater." Of the people registered as blind in 1951–52 who had cataract, no less than 81% had received no treatment for it. In only 5·8% of the cases registered was the condition said to be definitely irremediable, whereas in 34·4% it was remediable, in 30·1% the position was doubtful, and in 29·7% preliminary geriatric or other treatment might have made an operation possible. "At the lowest estimate, therefore, the available evidence suggests that 1000 persons whose sight might well have been saved by surgical treatment were added to the register of blind persons without receiving treatment, and that the saving of sight might well have been larger, especially if treatable patients were always seen before general infirmity precluded success."

Hospital boards are asked first to consider reorganising existing facilities—e.g., by regrouping ophthalmic beds in units of suitable size (say of 20), by ensuring the highest rate of turnover compatible with proper treatment, and by reorganising outpatient clinics.

1. R.H.B.(53)115.

JOINT CONSULTANTS COMMITTEE

AT a meeting of this committee on Dec. 15, Sir Russell Brain and Dr. T. Rowland Hill were re-elected as chairman and vice-chairman.

Among the matters discussed was the shortage of hospital junior medical staff, a problem on which the Ministry had sought the committee's advice. Attention was given to figures furnished by the Ministry which showed the distribution of medical staff in different types of hospital, and the numbers of posts, both filled and vacant; and a preliminary report was received from a subcommittee of the Central Consultants and Specialists Committee. This important matter will continue to receive urgent consideration.

The question of litigation arose again and in this connection a report was received from another subcommittee of the Central Consultants and Specialists Committee, which, with representatives of the three defence societies, had been discussing the matter with the Ministry.

It will be remembered that in 1949 hospital authorities were instructed by the Ministry that they should not undertake the defence of members of their medical staffs involved in legal actions, and that if it was sought to make the hospital authority responsible for the alleged negligence of the doctor the authority should take steps by legal process to obtain a contribution from the doctor in respect of any damages awarded to the plaintiff. This policy placed hospital staff in an obvious difficulty since their case-notes or reports might—if an action for negligence arose—be used by the authority to throw the onus upon them, and experience has shown that in the long run the Ministry's policy is likely to prove as embarrassing to hospital authorities as to their medical staffs.

2. Sorsby, A. The Causes of Blindness in England, 1948–50. H.M. Stationery Office, 1953. See *Lancet*, 1953, ii, 981.

Following the frank discussions which had taken place with the Ministry, an arrangement, acceptable to the defence societies, had been suggested to the Ministry which, if adopted, seemed likely to restore the good relations between hospital authorities and their staffs and allow the latter to coöperate fully with the authorities without jeopardising their own position. The Joint Committee approved the action taken, and decided that further consideration should be given to the question of medical reports, and particularly their accessibility to parties outside the hospital.

The committee again considered the position of S.H.M.O.s who were still dissatisfied with their grading, and decided to accept the suggestion of the Central Consultants and Specialists Committee that the latter committee should raise individual cases of alleged injustice directly with the Ministry. It was agreed that it should be made clear to the Ministry that the Joint Committee itself was far from satisfied with the position and that in pursuing the matter the Central Consultants and Specialists Committee had its full support.

The committee learnt with regret that, contrary to the advice which it had given to the Ministry, hospital boards had been told that in certain circumstances medical students might be employed for short periods. The committee felt that it could not condone this practice, nor advise the profession to accept any responsibility for students so employed.

Among the other matters discussed were the right of dental practitioners to call in dental consultants for domiciliary consultation, the disclosure of information to the Ministry of Labour regarding young men liable for National Service who had a history of tuberculosis, the principle that existing and newly appointed consultants should so far as practicable be allowed the option for whole-time or part-time service, and medical advisory machinery at regional-board level.

The following were appointed to constitute the Staff Side of Committee B of the Medical Whitley Council:

Mr. A. Lawrence Abel, Mr H. Arthure, Prof. W. G. Barnard, Sir Harold Boldero, Sir Russell Brain, P.R.C.P., Mr. J. Bruce, Dr. J. D. S. Cameron, Mr. W. W. Galbraith, Mr. A. A. Gemmell, P.R.C.O.G., Dr. T. Rowland Hill, Mr. H. H. Langston, Dr. A. Lyall, Mr. D. W. C. Northfield, Sir Arthur Porritt, Mr. T. Holmes Sellors, Sir Cecil Wakeley, P.R.C.S., Dr. S. R. F. Whittaker, and Dr. A. Macrae.

GENERAL PRACTICE IN SCOTLAND

THE fifth report of the Scottish Medical Practices Committee [1] states that at the end of last June there were 2505 doctors undertaking to provide general medical services in Scotland, compared with 2424 in 1952 and 2339 at the start of the National Health Service. Since then the number of people on the lists of doctors has increased by about 244,000.

DISTRIBUTION OF DOCTORS

According to information supplied to the committee by the executive councils, at Oct. 1, 1952, when the total of principals stood at 2369, there were 1100 single-handed doctors of whom 896 practised without an assistant. In rural areas the proportion of single-handed doctors was about twice what it was in semirural or urban areas and there was only one three-doctor and one four-doctor partnership. This is in contrast to England and Wales, where 68% of the doctors in rural areas practise in partnerships, of which nearly half are partnerships of more than two doctors. 138 single-handed doctors had fewer than 500 patients on their list; at the other end of the scale there were 72 single-handed doctors with more than 3000 patients. Only 2 had more than 4000 patients.

During 1953 the new arrangements for doctors' remuneration gave an impetus towards a more even distribution of medical care. The considerable increase in the number of partners was largely due to the notional-list payments. Thus during March and April, 1953, the number of new partnerships formed was 51, compared with 10 in the same period in 1952.

The committee doubt whether there will be any considerable immediate redistribution of patients as a result of the reduction of maximum numbers on lists from 4000 to 3500. They believe that entry into an existing partnership, with the use of partnership premises and a guaranteed share of the profits, will prove more attractive to many doctors than an attempt to build up a single-handed practice.

ENTRY INTO PRACTICE

During 1953 the committee granted 241 applications for admission to medical lists. Of these, 35 applications were from doctors selected to fill practice vacancies (including 13 to fill vacancies in partnerships), 106 applications were from doctors who wished to practise in partnership, 25 from doctors who wished to set up a new and independent practice, and 75 from doctors already on a medical list who wished to expand their practices into neighbouring executive-council areas. During the year 82 doctors died or resigned. 14 applications for inclusion in lists were refused; appeals to the Secretary of State against these refusals numbered 7. 2 appeals were withdrawn by the appellant before a decision was given, and 1 is still under consideration; in the remainder the decision of the committee was upheld by the Secretary of State.

The committee have noted that it is becoming increasingly difficult for a doctor already established in one practice to move to another, should he so wish. One possible method, which has been little used, is by arranging an exchange with another established doctor. Provided that the executive council in each area were satisfied with the proposed arrangements, the committee would normally raise no objection and would grant the applications by the two doctors for inclusion in the respective medical lists. Despite the increase in the number of principals, the committee are conscious that many doctors are unable to become established as principals, whether in single-handed practice with the assistance of the initial practice allowance or in a partnership.

1. The members of the committee are Dr. A. F. WILKIE MILLAR (chairman), Dr. I. D. GRANT, Dr. WALTER JOPE, Mr. A. I. MILLAR, Dr. C. STEWART SANDEMAN, and Mr. H. A. SHEWAN, Q.C.

HOSPITAL ENDOWMENTS FUND

DURING 1952–53 regional hospital boards and hospital management committees received from this fund £666,000, amounting to 28*s*. a bed.[1] This was the full amount due for the year. No part of the capital of the fund has so far been transferred to the boards and committees. The transfer of assets to the fund is still incomplete. It is estimated that with the settlement of outstanding matters a further £48,000 will be added to the fund, giving a gross total of about £31,600,000.

The transferred liabilities of the non-teaching hospitals, which have to be met out of the fund, are estimated at £11,600,000. Assets in excess of those earmarked for the fund have been realised from time to time and the proceeds used to meet transferred liabilities. During 1952–53 £600,000 was used in this way, bringing the total payment in discharge of liabilities to £10,400,000 at the end of the financial year.

1. Hospital Endowments Fund Account 1952–53. H.M. Stationery Office. Pp. 11. 6*d*.

NEW YEAR HONOURS

THE list of honours published on Jan. 1 contains the names of the following members of the medical profession :

G.C.V.O.

ALFRED EDWARD, Baron WEBB-JOHNSON, K.C.V.O., C.B.E., D.S.O., M.B. Viet., F.R.C.S.

Knights Bachelor

EDWARD CHARLES DODDS, M.V.O., M.D., D.SC. Lond., F.R.C.P., F.R.S.
Courtauld professor of biochemistry in the University of London at the Middlesex Hospital medical school.

ERIC WILFRED FISH, C.B.E., M.D. Viet., D.SC. Lond., F.D.S. R.C.S.
Chairman of the Dental Board; dental surgeon, St. Mary's Hospital, London.

FREDERICK TAVINOR REES, C.B.E., M.C., M.R.C.S.
Lately director-general of medical services, Ministry of Pensions.

BRIAN HERBERT SWIFT, M.C., M.D. Camb., F.R.C.S.E., F.R.A.C.S., F.R.C.O.G.
Consulting obstetrician, Queen Victoria Maternity Hospital, Adelaide; lecturer in gynæcology, University of Adelaide.

HARRY WYATT WUNDERLY, M.D. Melb., F.R.C.P., F.R.A.C.P.
Director of tuberculosis, Commonwealth Department of Health, Canberra.

C.B. (Military)

Major-General EDWARD PHILIP NAGLE CREAGH, M.B. N.U.I., M.R.C.P., Q.H.P.

Air Vice-Marshal VYVYAN STEWART EWING, C.B.E., M.B. St. And.

Major-General WILLIAM RALSTON DUNCAN HAMILTON, O.B.E., M.D. Glasg., Q.H.P.

Surgeon Rear-Admiral ROBERT WALSH MUSSEN, C.B.E., M.D. Belf., F.R.C.P.

C.B. (Civil)

GEORGE ALBERT CLARK, M.D. Durh.
A principal medical officer, Ministry of Health.

C.M.G.

Colonel HUGH WADDELL MULLIGAN, M.D. Aberd., I.M.S. retd.
Director, West African Institute for Trypanosomiasis Research.

WALTER GERALD WICKREMESINGHE, O.B.E., M.R.C.S.
Lately acting director of health services, Ceylon.

C.V.O.

WILFRID PERCY HENRY SHELDON, M.D. Lond., F.R.C.P.

WILLIAM ELDON TUCKER, M.B.E., M.B. Camb., F.R.C.S.

C.B.E. (Military)

Group-Captain CHRISTOPHER CROWLEY, M.B. N.U.I., R.A.F.

Brigadier ROBERT JAMES ROSIE, M.B. Edin., Q.H.P., late R.A.M.C.

Surgeon Capt. in ERIC THOMAS SUTHERLAND RUDD, M.B. Dubl., F.R.C.S.E., R.N.

Air Commodore CAMPION AUBREY RUMBALL, O.B.E., F.R.C.P., Q.H.P., R.A.F.

C.B.E. (Civil)

CYRIL JOHN AUSTIN, O.B.E., M.B. Edin.
Lately superintendent, Leprosy Hospital, Makogai, Fiji.

KATE ISABEL CAMPBELL, M.D. Melb.
Lecturer in neonatal pædiatrics, University of Melbourne; physician to children's department, Queen Victoria Memorial Hospital, Melbourne.

WILLIAM GEORGE CLARK, M.B. Glasg., F.R.C.P.E.
Lately medical officer of health for Edinburgh.

JAMES THOMAS CURRAN, M.B. Glasg.
Group physician-superintendent, Lennox Castle and associated institutions, Lennoxtown, Stirlingshire.

THOMAS HALL JAMES DOUGLAS, F.R.F.P.S., F.D.S. R.C.S.
Chief dental officer, Department of Health for Scotland.

THOMAS FERGUSON, M.D., D.SC. Edin., F.R.F.P.S., F.R.C.P.E.
Professor of public health, University of Glasgow.

CHARLES MONTAGUE FLETCHER, M.D. Camb., F.R.C.P.
Physician and senior lecturer, Postgraduate Medical School of London.

MUSTAPHA BIN OSMAN, M.D.
State medical and health officer, Kedah Federation of Malaya.

O.B.E. (Military)

Surgeon Commannder JOHN MORLEY HOLFORD, M.B. Camb., M.R.C.P., R.N.

Surgeon Commander EUSTACE ALWYNNE ROWLANDS, M.B. Melb., F.R.C.S., F.R.A.C.S., R.A.N.R.

Lieut.-Colonel DAVID WRIGHT, D.S.O., M.B. Glasg., F.R.C.S.E., R.A.M.C.

O.B.E. (Civil)

WILLIAM ARTHUR ANDERSON, M.B. N.Z., J.P.
Superintendent, Lake County Hospital, Queenstown, New Zealand.

GEOFFREY OSBORN BARBER, M.A., M.B. Camb.
Vice-chairman of Committee on General Practice, Central Health Services Council.

LOUIS GERARD BLAZÉ, L.M.S., L.R.C.P.
Lately acting deputy director of health (medical services), Ceylon.

REGINALD MURRAY DUNSTONE, M.B. Glasg.
For public and social-welfare services in the Commonwealth of Australia.

MACORMACK CHARLES FARRELL EASMON, M.D. Lond.
Senior medical officer, Sierra Leone.

DENNIS HERBERT GEFFEN, M.D. Lond.
Medical officer of health for St. Pancras and Hampstead.

JOHN THOMSON GUNTHER, M.B. Sydney.
Director of the department of public health, Territory of Papua and New Guinea.

GOPAL HARIDAS, M.D. Malaya, M.R.C.P.
Physician to the General Hospital, Singapore.

SAMUEL HORTON OLUWOLÉ JONES, M.B. Manc.
Director of medical services, Gambia.

JOHN WILSON MCCAGIF, L.R.C.P.E.
Lately senior medical officer, Ministry of Pensions.

VATAPAKAT RAMANMENON NARAYANA MENON, M.B.
Medical officer, Dindings, Federation of Malaya.

Reverend Sister MARGARET MARY NOLAN, M.CH. N.U.I., F.R.C.S.I., F.R.C.O.G.
Gynæcologist, St. Luke's Hospital, Anua, Southern Nigeria.

BERTIE SOUTAR SIMPSON, M.B. Edin., F.R.C.S.E.
Consulting surgeon for the county of Sutherland.

JAMES ANDERSON SMILEY, M.D. Belf.
Appointed factory doctor for East Belfast.

HENRY GEORGE TRIAY, M.D. Edin.
Pædiatrician, Colonial Hospital, Gibraltar.

HUBERT CAREY TROWELL, M.D. Lond., F.R.C.P.
Specialist (physician), Uganda.

WILLIAM HENDERSON WATSON, M.D. Glasg.
Officer-in-charge, Mental Hospital, Nyasaland.

M.B.E. (Military)

Captain JAMES DAVID CAMERON, R.A.M.C., T.A.

Captain ANTHONY ST. CLAIR REX DE COSTA, M.B., Ceylon Volunteer Force.

Squadron-Leader CHRISTOPHER BERKELEY WYNN-PARRY, B.M. Oxfd, R.A.F.

M.B.E. (Civil)

RATU JIONE ANTONIO RABICI DOVI, M.B.
Medical officer, British Solomon Islands Protectorate.

JOSAIA NAVOKA
Lately assistant medical practitioner, Fiji.

VISHNUPRASAD BALKRISHNA PANDIT, L.C.P.S.
Senior sub-assistant surgeon, Uganda.

ETHEL JOYCE SAWARD, M.R.C.S.
For medical services in Jamaica.

CHARLOTTE ANNIE STUART, M.B. Dubl.
Principal medical officer, Church Missionary Society Hospital, Cairo.

RAPHAEL LAWRENCE TIRUCHELVAM, M.P.H. Harvard, M.R.C.S.
Acting director of social services, Ceylon.

Bar to A.F.C.

Wing-Commander HARRY HAMILTON SCOTT BROWN, A.F.C., M.B. Durh., R.A.F.

A.F.C.

Group-Captain DENIS AYMARD WILSON, M.R.C.S., R.A.F.

Wing-Commander GEOFFREY HOWARD DHENIN, G.M., M.B. Camb., R.A.F.

Surgeon Lieut.-Commander WILLIAM HERBERT BAXTER ELLIS, M.B. Durh., R.N.

Management of Burns

A series of six articles prepared by a subcommittee of the British Association of Plastic Surgeons *

II. FLUID REPLACEMENT IN BURNED PATIENTS

FOLLOWING a burn, metabolic upsets may occur in tissues both nearby and at a distance from the site of injury. These are characterised by changes in the distribution of the body-fluids, in osmotic equilibrium, in concentration of electrolytes, and in intermediary metabolism and hormonal equilibrium.[1] Before a rational programme of replacement can be suggested, it is necessary to consider both the reason for, and the nature of, the loss from the circulation as a result of the injury.

Cope [2] compares the burn wound to a leech which sucks water, protein, and electrolytes from the plasma circulating through its depths. The permeability of the capillary membrane is increased and there passes into the burned tissues a protein-rich filtrate. The rate of œdema formation is most rapid in the first eight hours and extends over a period of 48 hours. There follows a period of fluid reabsorption and steady diminution of œdema. This phase is most evident on the third day after the burn.

As to the nature of the fluid loss, the electrolyte pattern is that of plasma or extracellular fluid. The concentration of protein is greater than that of tissue fluid, though less than that of plasma.

In the initial phase following a burn, there is a slight rise in the protein concentration of the plasma, which increases the colloid osmotic pressure. Fluid is absorbed from the unburned tissues into the blood-stream, leading to a second phase with a dilute plasma. In the initial phase, reabsorption from the burn into the concentrated plasma is impossible owing to the damaged capillary membrane. In the second phase, in extensive untreated burns, fluid is drawn from the interstitial spaces into the blood-stream with a rise of colloid protein in the interstitial fluid. Water is then drawn in turn from the cells into the extracellular space. There may be permanent damage to renal cells if dehydration is not adequately treated.

Red cells are directly destroyed by heat in a burn that is sufficiently deep to coagulate the dermal capillaries. There is also a delayed hæmoglobinæmia, which may be due either to intravascular hæmolysis of cells not completely destroyed but rendered more fragile by the same process [3] or to a specific hæmolytic factor produced at the site of injury. The process of coagulation limits the continued exudation of fluid upon the surface; consequently, in an extensive deep burn the loss of whole blood may account for as much as 40% of the total volume deficit.[4]

In the first twenty-four hours, the main danger to the extensively burned patient lies in the possibility of tissue anoxia. Its prevention lies in adequate transfusion of whole blood. The sources of loss of the red cells are: (*a*) their destruction in the burnt area; (*b*) fragmentation and increased fragility of cells from thermal injury; (*c*) stagnation in capillary beds; and (*d*) sludging.

Ideally the solutions for replacement would contain colloid and electrolyte to replace the water, electrolytes, and protein lost into the wound. Water should be given by mouth to maintain normal renal function. Plasma and saline should be given in equal proportions so that the total protein and electrolyte content approximates to that of the fluid lost into the injured area.[5] In practice, most or all of the electrolyte requirement can be given by mouth. Blood should be given in all cases of deep burns, and since, as stated above, nearly half of the volume deficit may be due to whole-blood loss, it is suggested that whole blood should replace up to half of the plasma-saline requirement in the first eight hours. Increased hæmoconcentration is not considered to be a contra-indication to the giving of blood and is, in fact, reduced by its administration.

When a burned patient is admitted with an already poor capillary circulation, as indicated by a slow return of colour on pressure, with or without cyanosis, whole blood is given at the calculated rate until the condition begins to improve, irrespective of the depth of the injury.

In the early stages of treatment of a deep burn, the administration of whole blood substantially delays and limits a characteristic anæmia which may complicate the state of healing. In addition to replacing fluid, the metabolic requirement must be met in full by giving the required amount of fluid for the age of the patient.

Biochemical investigation of changes in the inorganic constituents of the circulating blood has not been used as a guide to fluid and electrolyte requirements because of the necessity for simplicity, and because a functioning kidney is the best regulator of blood chemistry; the aim should be to restore function to this natural regulating mechanism by prompt and adequate restoration of the circulating blood volume.

Fluid replacement will be discussed under four headings: (*a*) amount of fluid required; (*b*) rate and route of administration and type of fluid required; (*c*) assessment of progress; and (*d*) an aid to rapid and correct calculation and assessment.

AMOUNT OF FLUID REQUIRED

If patients with extensive burns are to have a chance of survival, their fluid requirements must be calculated very carefully. Too little will mean oligæmic shock, too much will result in pulmonary œdema. The margin of safety on either side is small and decreases towards the extremes of life. Empirical assessment of the patient's fluid requirement can never be satisfactory, even in experienced hands, and a method which combines safety with effectiveness and simplicity is to be preferred.

Three methods are available, although not all are equally satisfactory.

(1) The patient's needs are assessed by *blood biochemistry and hæmatocrit readings*, repeated at hourly or even more frequent intervals. An increasing hæmatocrit reading will indicate the need for more rapid replacement, and decreased readings for curtailment. Plasma-sodium and plasma-potassium studies will reveal whether more electrolyte is required in proportion to plasma. But this method has disadvantages:

(*a*) In patients with deep burns there is usually considerable destruction of red blood-cells in the tissues, a state which at once invalidates hæmatocrit readings, because a patient in grave oligæmic shock, with considerable relative hæmoconcentration, may show a normal hæmatocrit reading.

(*b*) The technical difficulty of extracting enough blood from a shocked child for serial hæmatocrits may be insurmountable, and even in adults it is, at the best, uncomfortable.

(*c*) A large laboratory staff is necessary for electrolyte studies, and medical staffs faced with large numbers of burns may find themselves unable to spare time for accurate hæmatocrit estimation.

(2) A much more satisfactory method is to work from a *formula based on the extent of the burn in relation to the patient's weight* (or age in children, since the child's weight is often not known with certainty, and the

* The members of the subcommittee are: Mr. R. J. V. BATTLE, Mr. PATRICK CLARKSON, Mr. RAINSFORD MOWLEM, Mr. ROWLAND OSBORNE, and Mr. A. B. WALLACE. They are glad to acknowledge assistance from Mr. A. D. R. BATCHELOR and Mr. R. L. G. DAWSON.

1. Moore, F. D. National Research Council Symposium on Burns. Washington, D.C., 1951.
2. Cope, O. *Ibid.*
3. Shen, S. C., Hama, T. H., Fleming, E. M. N. *New Engl. J. Med.* 1943, **229**, 701.
4. Evans, E. I., Biggar, I. A. *Ann. Surg.* 1945, **122**, 693.
5. Cope, O., Moore, F. D. *Ibid*, 1947, **126**, 1010.

TABLE I—PLASMA AND ELECTROLYTE REQUIREMENTS AT DIFFERENT AGES

Age (yr.)	Birth to 3/12	3/12–6/12	6/12–9/12	9/12–1	1–2	2–3	3–4	4–5	5–6	6–7	7–8	8–9	9–10	10–11	11–12	12–13	13–14	14–15	15–16	16–17	17–18	Adult
Electrolyte solution (ml.)	7	10	12	13	15	21	24	27	31	35	40	44	46	51	56	62	67	78	88	96	104	110
Plasma (ml.)	7	10	12	13	15	21	24	27	31	35	40	44	46	51	56	62	67	78	88	96	104	110

TABLE II—AVERAGE WEIGHT AT DIFFERENT AGES

Age (yr.)	Birth to 3/12	3/12–6/12	6/12–9/12	9/12–1	1–2	2–3	3–4	4–5	5–6	6–7	7–8	8–9	9–10	10–11	11–12	12–13	13–14	14–15	15–16	16–17	17–18	Adult
Weight (kg.)	5	7	9	10	13	15	17	18	20	22	24	26	29	32	35	39	43	48	54	59	65	70

TABLE III—FLUID INTAKE (AS GLUCOSE DRINKS OR WATER) REQUIRED TO COVER NORMAL METABOLIC REQUIREMENTS

Age (yr.)	Birth to 3/12	3/12–6/12	6/12–1 yr.	1–2	2–3	3–4	4–5	5–6	6–7	7–8	8–9	9–10	10–11	11–12	12–13	13–14	14–15	15–16	16–17	17–18	Adult
Metabolic requirement (ml.)	700	1000	1150	1200	1300	1400	1400	1400	1500	1500	1500	1600	1600	1700	1700	1800	2000	2200	2400	2600	2800	3000

difference in weight for children of a given age is not significant in this context). Briefly, the basis of the formula is as follows (modified from Cope and Moore [5]):

(*a*) The demands on the patient caused by the wound are proportional to its extent.

(*b*) The protein concentration of belb fluid is half that of plasma, and its electrolyte concentration is the same as that of plasma.

(*c*) The maximum expansion of the extracellular fluid spaces compatible with safety is 50%—i.e., about 10% of the body-weight on the average.

(*d*) The rate of œdema formation follows a parabolic curve, rapid initially and tapering off as wound pressure increases; œdema is maximal at forty-eight hours, and is thereafter reabsorbed, often rapidly, promoting a considerable diuresis.

Given a base line, the patient's fluid requirement can be calculated from these facts. The base line adopted by Cope and Moore, which works well in practice, is that 75 ml. each of plasma and electrolyte per 1% of the body-surface burned in the adult must be given in the first twenty-four hours from the time the burn was sustained, and half that amount in the second twenty-four hours. As we will later show, however, it is more convenient to calculate for the first forty-eight hours, and for this period a figure of 110 ml. each of plasma and saline per 1% of body-surface burned gives satisfactory results. The fluid is given in equal quantities in the periods 0–8, 8–24, and 24–48 hours after the burn, and the total is therefore divided into thirds when calculating the rate at which fluid must be given. For children, proportionately less is required. These figures hold good unless the calculated total exceeds 10% of the body-weight, and in practice this occurs in burns involving about 30% of the body-surface.

The figures for different ages are given in table I. They indicate the number of millilitres of plasma and electrolyte required per 1% of body-surface burned, given in equal quantities in the periods 0–8, 8–24, and 24–48 hours after the burn (from the time at which the burn was sustained, not the time at which the patient was admitted to hospital). This table applies for burns of up to 30% of the body-surface. When the burn exceeds 30% of the body-surface, an amount of fluid equivalent to 10% of the body-weight is given. The average weight for various ages is given in table II. It is emphasised that the amount for adult patients should be calculated from weight, for obviously a small woman will require less than a well-developed man; the simplest way is to ask the patient what his or her weight is.

The calculated total (1 kg.=1 litre) is divided into thirds, and one-third is given in the periods 0–8, 8–24, and 24–48 hours after the burn.

These fluid totals are given to replace fluid lost from the circulating blood volume as a result of the burn; in addition, all patients must receive an adequate amount of fluid to cover normal metabolic requirements (table III). The amounts shown are given by mouth each twenty-four hours, in hourly divided doses, as glucose drinks or as water, unless the patient is unable to retain the fluid (see below).

From tables I, II, and III the exact amount of fluid required can be easily ascertained. In cases of extensive burns in the region of 50% or more, it may become evident that more fluid is needed, in which case it should be given (for assessment of progress, see below). Only healthy adults can stand more than the original calculated fluid, and the figures given are judged to be safe for all cases, except when renal function is impaired.

(3) A third method which gives satisfactory results is to calculate the fluid required as 1 ml. per kg. body-weight per twenty-four hours for every 1% of body-surface burned.[6] Rather more calculation is required in this method than is necessary when working from the tables, and again a weight-age table is necessary for children, but the formula is easily remembered and is useful when tables are not to hand. Evans [6] places his maximum dosage at 50% burn of the body-surface, as opposed to the 30% of the other method.

A necessary adjunct to methods (2) and (3) is a chart for estimating the percentage of body-surface burned. A simple working diagram is provided by the "rules of nine" (fig. 1).

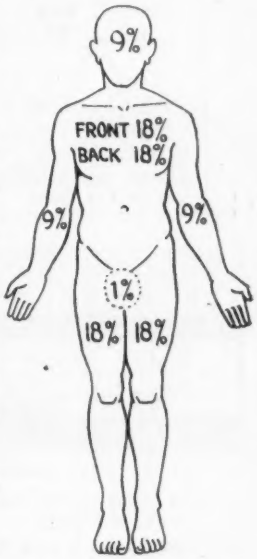


Fig. 1—"Rules of nine" for estimating area of burn.

RATE AND ROUTE OF ADMINISTRATION AND TYPE OF FLUID REQUIRED

As we have indicated, equal fluid totals are to be given in the periods 0–8, 8–24, and 24–48 hours after the burn—i.e., from the time at which the burn was sustained, not from the time of admission to hospital. A rough guide to the speed at which an intravenous drip should run is given by Aird [7]:

(Number of litres required in twenty-four hours) × 12= number of drips per minute.

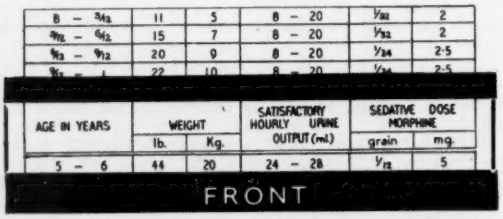
Patients with burns of less than 10% of the body-surface do not require fluid intravenously: the calculated

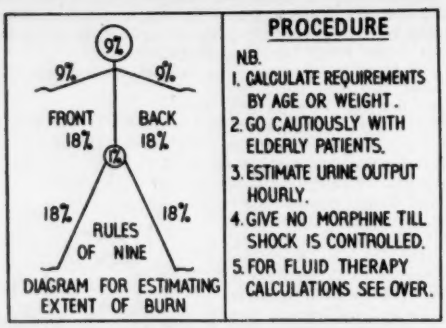
6. Evans, E. I. National Research Council Symposium on Burns. Washington, D.C., 1951.
7. Aird, I. A Companion in Surgical Studies. Edinburgh, 1949.

amount is added (as glucose drinks or water) to the normal intake by mouth (table III).

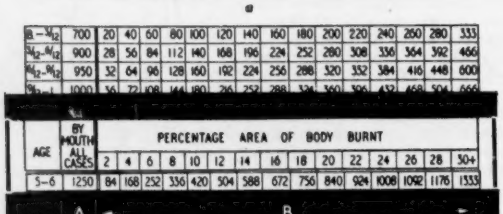
Children with burns of more than 10% and adults with burns of more than 14–15% must receive fluid intravenously, since shock in these patients cannot be controlled by oral intake. The choice of intravenous fluid depends on the depth and extent of the burn. A good working rule is:

In wholly superficial burns of less than 25%, equal parts of plasma and electrolyte solution are given. The most readily available electrolyte solution in this country is isotonic saline, which works reasonably well in practice, although there is no doubt that a solution containing potassium as well, such as Darrow's or Hartmann's, is theoretically more desirable. In children under two years, with immature power of the kidneys to excrete sodium, a solution of 4·1% glucose and 0·18% sodium chloride is advisable.





a



SEE OTHER SIDE FIRST

1. ALL PATIENTS TO RECEIVE TOTAL 'A' (ml.) BY MOUTH AS GLUCOSE WATER EACH 24 HOURS.
2. FOR BURNS OF LESS THAN 10% ADD TOTAL 'B' (ml.) TO ORAL INTAKE AS GLUCOSE WATER.
3. FOR SUPERFICIAL BURNS OF 10–25% GIVE TOTAL 'B' (ml.) INTRAVENOUSLY. ½ AS PLASMA, ½ AS SALINE, ½ IN FIRST 8 HRS AFTER BURNING, ½ IN NEXT 16 HRS.
4. FOR DEEP BURNS AND ALL BURNS OF MORE THAN 25% GIVE TOTAL 'B' (ml.) INTRAVENOUSLY, ½ AS BLOOD, ¼ AS PLASMA, ¼ AS SALINE; ½ IN FIRST 8 HRS. AFTER BURNING. ½ IN NEXT 16 HRS.
5. FOR SECOND 24 HRS. GIVE TOTAL 'A' (ml.) AS BEFORE, AND ½ TOTAL 'B' (ml.) SIMILAR FLUIDS, SAME ROUTE.
6. IF ORAL FLUIDS ARE REFUSED, GIVE TOTAL 'A' AS 5% DEXTROSE SOLUTION INTRAVENOUSLY AND GIVE TOTAL 'B' AS DESCRIBED ABOVE

b

Fig. 2—The 'Pyrogram' ready-reckoner: (a) front, (b) back.

TABLE IV—SATISFACTORY HOURLY URINE OUTPUT

Age (yr.)	Birth to 1	1–5	6–10	11–14	14+
Satisfactory hourly urine output (ml.)	8–20	21–25	26–30	31–50	51–100

In burns of more than 25%, or if any appreciable part of the burn is deep, every effort should be made to give half the total intravenous requirement as fresh whole blood, the other half being given as equal parts plasma and saline. The blood is necessary to provide oxygen carriers for vital organs in which anoxia is disastrous, and also to minimise postburn anæmia which delays healing. This statement applies particularly to children.

If plasma is not available, plasma substitute will suffice.

The metabolic requirement is given by mouth as glucose drinks or water, unless the patient is unable to retain fluid by mouth. This state of affairs is fairly common in severe burns, and appears to be due to a considerable gastric stasis, often verging on an acute dilatation of the stomach. It may also supervene if the throat has been burnt, or if there have been other injuries which have resulted in loss of consciousness. In these cases the metabolic requirement is added to the intravenous drip as 5% dextrose in water. When fluid is being taken by mouth, it is best given at hourly intervals, thus reducing the tendency to repletion.

ASSESSMENT OF PROGRESS

The best check on the adequacy or otherwise of fluid therapy is an hour-to-hour watch over the renal output. This necessitates the passage into the bladder of an indwelling catheter, which is released hourly, and the amount collected carefully measured. In adults a satisfactory hourly excretion is between 50 and 100 ml.; less than 30 ml. and more than 150 ml. indicate inadequacy or excess. In children, satisfactory values are proportionately lower (table IV).

If possible, hæmoglobin or hæmatocrit readings are taken at regular intervals as an additional check, but it cannot be emphasised too strongly that the urine output reflects the internal fluid balance much more quickly and accurately than laboratory tests, and that significant alteration in urine output precedes significant alteration in hæmatocrit or hæmoglobin readings.

AN AID TO RAPID AND CORRECT CALCULATION AND ASSESSMENT

The information from tables I and IV has been grouped in a convenient form as a ready-reckoner (figs. 2a and b).

The device provides a sliding table which can be adjusted so that the figures relevant to a particular age are viewed through windows on the front and back. On the front, oral and intravenous requirements are seen through the window and below are instructions about rate of administration, route, and type of fluid. On the back, a weight-age table, satisfactory hourly urine output, and a table of doses of sedative are seen through a window, and below this is a diagram of the "rules of nine" and a note of the precautions to be observed in treatment.

The ready-reckoner measures $2^1/_4$ in. × $2^3/_4$ in., and can be carried in the pocket. It is known as the 'Pyrogram' and is made and supplied by Allen & Hanburys Ltd.

The tables in this article have already appeared in a different form in the *Practitioner*.[8]

T. L. BARCLAY
M.B. Edin., F.R.C.S.E.
A. B. WALLACE
M.B. Edin., M.Sc. McGill, F.R.C.S.E.
Department of Surgery, University of Edinburgh

8. Wallace, A. B. *Practitioner*, 1953, 170, 109.

In England Now

A Running Commentary by Peripatetic Correspondents

CATCHING up on my back *Lancets* during some coryzal leisure I was disturbed to see the P.R.C.P. affirming that on the whole the happiest people are those whose work is of such absorbing interest that for them there is no great distinction between work and play.[1] For my part I have been forced to the conclusion that most of the ills of our civilisation are due to making work a pleasure. I have always thought that the happiest people are those who can sit in the sun doing nothing, except possibly smoking a pipe. If work becomes your recreation, how can you enjoy leisure? The trouble with most of us nowadays is that we cannot be happily idle. Are the happy hard-working people happier than the happy indolents? I doubt it. Work should be drudgery if it is to be safe, otherwise people exceed the proper dose.

Take washing-machines. (If you are considering The Whole Patient you have to take washing-machines nowadays.) When washing is done by hand in a sink or tub the job isn't too attractive—it is hot, steamy, and backaching. You can get job-satisfaction out of it, no doubt, but you can't call it recreational. But washing-machines are playthings. Turn on the switch. How seductively simple! And the ironer—simply press the button. Pretty, attractive toys! Therein lies the danger. People become addicted to these machines. They will play with them on Saturday afternoons, and even on Sundays. Soon they are at it seven days a week. Happy they may be, these poor addicts, but what fills their minds? Nothing but Swish, Swosh, and all the other new super-improved washing agents. "Stick to Swish for a whiter wash." "You'll be delighted to see how much more dirt you get out after using Swosh." That is the philosophy that these Swish-addicts and Swosh-fans are soaking up.

No, no. Work should not become a pleasure. Drudgery is a Good Thing, because it is not habit-forming. And preferably someone else should do it, while I sit in the sun and smoke my pipe.

* * *

I have just been informed by a boy in the remand home that "there are so many coppers about nowadays that nobody can't get doing nothing." Is this a case of negativism?

* * *

England and Wales stand firm in their ideals, and the powers-that-be of the Youth Hostels have reaffirmed their ban upon the internal combustion engine. When the hostel door is unbolted at the ritual hour of five, the queue of men and maidens who seek a celibate bunk must swear that they have reached the haven with dusty shoes, or on the simple bicycle unadorned with a pop-pop motor. The spirit of Sparta dwells in this last stronghold of the heroic athlete. Shame on the Picts and the Scots, faithless to the endurance reared on oatmeal and herrings, prostituting their native engineering genius by countenancing mechanical forays in the glens. Shame on the Celtish clans of the Emerald Isle for preferring petrol to poteen to reach the end of the road. Shades of St. Patrick! Shades of St. Christopher? And likewise those lesser breeds without the law across the Channel, who know not mens sana in corpore sano. A murrain on their decadence.

But of course nothing is as simple as it seems. As I drive around one of our National Parks, winter and summer, with three empty seats in my car for all to see, I am an obvious target for the hitch-hiking fraternity. My response to the jerking thumbs varies with the mood of the moment, the attractiveness of the jerker, the demeanour and originality of the gesture. My hackles rise at the peremptory signal which conveys the message that its maker claims his lift as of right. I grit my teeth and press my foot hard down. Let the fellow walk off his arrogance, a few more miles will cleanse his soul!

A smiling face is hard to pass. The cheerful optimist who plods onwards, with his head glued over his shoulder, giving smile after smile into windscreens he cannot penetrate, has got a quality of character which will see him far along life's road. Even the unattractive can kindle the spark of compassion. Overtaking, attention focuses on the drooping shoulders and bent neck behind the rucksack burden, the mild stagger of fatigue, the sagging insteps, the tell-tale limp of blisters. The lengthening shadows of eventide, or the pitiless drizzling rain, tip the scales of charity in favour of the traveller. If I leave him, my conscience is pricked; if I pick him up he looks like collapsing on me at the worst, or leaving puddles of water on the upholstery at the best; he is a dull dog, and my reward can only be in Heaven.

Our foreign visitors are more ingenuous. They hang their national flags on their rucksacks, and, as hosts, we are in common courtesy bound to help them on their way. Some of our transatlantic visitors have developed the sandwich-board technique to indicate what they are and where they want to go. The final touch was presented by a couple of muscular youths reclining on the roadside verge, with a large banner set up on the kerb to detail their transport requirements. I had the bad manners to drive past.

A peripatetic life has thus made me familiar with most of the popular subterfuges to qualify for a bunk at the hostel. Despite a comfortable elasticity in assessing the youth of guests, the expenditure of foot-pounds remains an inexorable condition and the youth of England must stand upon their own feet—at least long enough to thumb a lift.

* * *

Last week I had tea with one of my 80-year-old patients and shared his birthday cake. I remembered that since his retirement he had played his violin for about half an hour every day—always the same piece. So I asked him how his music was getting on. "Oh, I still practise every day," he said, and added, sadly, "But I never get any better." Then, as if to soften this gloomy thought, he looked up and said: "But look at Kreisler, he plays every day and he doesn't get any better, does he?"

* * *

We were discussing the difficulties of working in a strange theatre and I mentioned different lighting, height of table, strange nursing staff and especially theatre sister. My bright anæsthetist agreed he also didn't like it. "Give me," he said, "the coroner I know."

* * *

COSTING

Costing's now the cure-all,
Medicine's on the wane;
Hail our panacea
And join us in refrain:
Hurrah for the Coster-mongers,
Push Admin. down the drain!

Costing à la King's Fund,
Average costs per pain?
Nuffield's time-commotion?
Treasurers' Penny Plain?
Hurrah, &c.

Costing stands for Empire!
Admin.'s loss, our gain;
All objective headings
Are subject to our reign.
Hurrah, &c.

Horizontal posting
(Vertical's a strain!),
Overheads to subheads
And no-one will complain.
Hurrah, &c.

Where's the cost of costing?
(Conjuring's our domain!)
Roll the moss that gathers
For stone châteaux in Spain!
Hurrah for the Coster-mongers,
Push Admin. down the drain!

1. *Lancet*, 1953, ii, 981.

Letters to the Editor

R.M.B.F. CHRISTMAS GIFTS FUND

SIR,—It is a very great pleasure to report that the amount contributed to the Christmas Gifts Fund was most satisfactory and exceeded that of all previous years.

It is impossible for me to thank the contributors personally for their generous response to my appeal, but through you, Sir, I should like to thank all your readers who have helped.

I am specially grateful to the many B.M.A. divisions and branches, medical societies, and local medical committees who either forwarded donations from their own funds or arranged for collections to be made at an autumn meeting.

The many messages of goodwill sent with donations show how much this Christmas effort of the Royal Medical Benevolent Fund is approved of by the profession.

It is hoped that as each Christmas comes round this work of kindness and good fellowship will be continued. I ask those who read the Christmas appeals in future to bear in mind the intense pleasure and gratitude felt and expressed by those who benefit from the appeal.

I desire to express my own very sincere appreciation of the generosity which has been shown.

WEBB-JOHNSON
President, Royal Medical Benevolent Fund.

*** We understand that the sum contributed was about £2950.—ED. L.

VISITING CHILDREN IN HOSPITAL

SIR,—In your annotation of Nov. 28 an important aspect of visiting children in hospitals is not mentioned—namely, the introduction of secondary infections which may sometimes be quite serious. Although it may "only mean" a common cold, the virus usually runs like wild-fire through the ward, holds up progress, prevents anæsthesia, and lengthens the average stay of the children in hospital; and therefore adds very considerably indeed to the annual cost of running the ward. It would be interesting to obtain the average lengths of stay for similar cases in two hospitals, of which one allowed daily visiting and the other prohibited visiting. Bacteriological samples of the air in a ward after visitors have left might yield some interesting facts. We ourselves, because of these risks, practise mother-nursing in single rooms, with practically no visiting, for all our infant surgical cases, and we believe it should be "all or none." Under these conditions, we get absolutely no cross-infection and very rarely a common cold, which never spreads.

We have just concluded a successful year's surgical work at our "mother and baby" hospital. There has been no morbidity whatever, no mortality, and no failure of any operation, despite 3 full operation sessions a week. This we ascribe to no cross-infection and no introduced infection by visitors.

H. P. PICKERILL
CECILY PICKERILL.

Wellington, New Zealand

*** We hope to publish shortly an article by Mr. and Mrs. Pickerill describing their system of hospital nursing by the mother.—ED. L.

OPERATING-THEATRE INFECTIONS

SIR,—We have been following with great interest the correspondence in your columns on this subject. The letter by Mr. Fowler (Dec. 19) suggests consultation with pharmaceutical manufacturers, and this appears to us to be a valuable contribution.

In our own case, the aseptic areas in our factory are of particular interest to those studying conditions in operating-theatres, for these areas are of approximately the same size as operating suites and the number of people using them is approximately the same as in an operating team.

We have, ever since we opened our factory, kept records of the results of plate exposures made in the various areas of our aseptic rooms under varying conditions of population, time, and temperature, and these results are available to anyone who is interested and would care to study them. We will be very pleased to place this, and any other information about air filtration, &c., at the disposal of hospital authorities who may be interested.

Ethicon Suture Laboratories,
Bankhead Avenue,
Edinburgh.

J. OWEN DAWSON
Technical director.

TOXIC EFFECTS OF PRIMIDONE

SIR,—Primidone ('Mysoline') was first introduced into clinical practice in the treatment of epilepsy about two years ago. Since then trials have been reported by Handley and Stewart [1] (from the David Lewis Epileptic Colony), Butter [2] (in sane epileptics), and Whitty [3] (in a mixed group of epileptics attending a neurological out-patient clinic), and, in your issue of Jan. 2, by Dr. Briggs and Dr. Tucker (in children with petit mal), and by Dr. Nathan (in patients with non-idiopathic epilepsy). It is generally agreed that this drug has worthwhile advantages over the older anticonvulsant drugs in the control of grand-mal epilepsy and in the so-called "temporal-lobe epilepsies," and that it may be beneficial in some cases of petit mal.

All the reports have described toxic effects with the use of primidone but these were, on the whole, mild and transient.

In Handley and Stewart's series of 40 patients, there was 1 patient with a morbilliform rash, 1 with slight nausea, and 2 with transient and mild feelings of drunkenness. In another series, several patients complained of dizziness, disturbance of accommodation, listlessness, and difficulty in rousing from their sleep. These symptoms arose during the first week of treatment and passed off in the course of a few days. In no case was it necessary to stop the treatment because of a toxic effect.

In Butter's series of 58 cases almost all patients complained of slight drowsiness or listlessness for a day or two, and in 8 patients the drowsiness was sufficiently persistent to warrant discontinuing the treatment. 2 other patients were slightly ataxic, 1 had slurred speech, and 1 complained of nausea.

5 out of 70 of Whitty's patients on primidone had to discontinue the drug, but in 2 cases this was probably unnecessary. In 2 cases the drug was withdrawn because of the development of a confusional psychosis, in another 2 because of persistent vomiting, and in 1 because of transient nausea, giddiness, and ataxia, which also affected 3 other patients to a lesser degree. 58 patients complained of drowsiness initially, though in all but 12 it cleared up within a week. Urticarial rashes appeared in 2 cases.

Within the last month or two, 4 outpatients at this hospital have shown what might be best described as a peculiar idiosyncrasy to primidone, which became apparent after the administration of just one tablet of the drug and which necessitated stopping treatment.

CASE 1.—A woman, aged 38, complained of "peculiar turns" during which she would become confused, feel faint, and act rather automatically. They usually occurred within a few days of her menstrual periods. The E.E.G. was compatible with a diagnosis of epilepsy, but showed no localising signs. She was prescribed primidone but after taking one 0·25 g. tablet she became nauseated, violently sick, and drowsy. She complained of severe head pains, double vision, and "pins and needles" over her head, face, and neck. She felt ill for a day or two. Before this she had been taking gr. $1^1/_2$ of phenobarbitone nightly.

1. Handley, R., Stewart, A. S. R. *Lancet*, 1952, i, 742.
2. Butter, A. J. M. *Ibid*, 1953, i, 1024.
3. Whitty, C. W. M. *Brit. med. J.* 1953, ii, 540.

CASE 2.—A boy, aged 17, had rage attacks accompanied by automatisms. His E.E.G. was in keeping with a diagnosis of epilepsy. He was given primidone but, half an hour after taking the first tablet, he felt drowsy, complained of feeling sick, and started to vomit. He felt so weak and dizzy that he could not stand without support. He was excessively drowsy for several hours. It was only after two days that he returned to normal. This patient had not been on anticonvulsants before.

CASE 3.—A woman, aged 50, had "turns" during which she stared vacantly into space, chewed, and smacked her lips. She had an aura of an unpleasant smell and a sour taste. She had been having small doses of phenobarbitone. After taking one 0·25 g. tablet of primidone she became nauseated, repeatedly vomited, and became dizzy and drowsy. Three days later she took half a tablet, but the symptoms recurred.

CASE 4.—A woman, aged 55, showed an epileptic record on E.E.G. of the temporal lobe variety. Clinically she had automatisms and petit mal. One hour after taking one 0·25 g. tablet of primidone she felt drowsy. Two hours after the tablet she felt faint and severely nauseated and had a headache. She became so weak that she could not stand and her husband had to carry her to bed. For two days she lay in bed feeling drowsy and weak and too nauseated to eat. This patient had been on gr. $^1/_2$ of phenobarbitone twice daily for several weeks.

Primidone is an extremely useful drug but it is not unusual for many patients to complain of initial drowsiness which, however, generally clears up after a few days and should not discourage the continuance of the drug. Other benign toxic effects are mild nausea and listlessness.

The toxic effects are referable to disturbance of function of the central nervous system and are reminiscent of the toxic central effects of phenytoin sensitivity. In the 4 cases described here, the symptoms were similar to those described in earlier reports. But a single tablet produced fulminating symptoms, just as in the case described by Briggs and Tucker, in contrast to the more gradual onset previously described. The response was probably the result of a hypersensitivity.

I wish to thank Dr. R. Ström-Olsen for permission to publish these cases and Dr. D. W. Liddell for help and advice.

Runwell Hospital,
near Wickford, Essex. S. GOLDIN.

PROLONGED APNŒA FOLLOWING SUXAMETHONIUM

SIR,—I am interested in Dr. Franks's letter (Dec. 26) in which he states that in nearly 1000 administrations of suxamethonium he has met with only 1 case of prolonged apnœa. He attributes this to his moderate dosage of suxamethonium, but I wonder whether it is not as much due to his very modest dose of thiopentone (he cites 250 mg.).

I believe that prolonged apnœa following suxamethonium and due to an abnormally low plasma-pseudocholinesterase level is extremely rare and that such cases must be characterised by a *gradual* return of respiratory volume to normal. I have never seen such a case, but I have frequently met with prolonged apnœa following suxamethonium. My cases have always "bucked" following a blast of ether, and once the respiratory rhythm has returned the volume has been almost immediately full. I have presumed that the cause has been a depression of the respiratory centre and not a prolongation of muscular paralysis.

I have noticed that the smaller the dosage of accompanying respiratory depressants the rarer is prolonged apnœa; likewise, the elimination of an endotracheal tube and the reduction of artificial ventilation to a minimum, in both volume and rate, will diminish the incidence.

These observations, if correct, suggest that depression and reflex inhibition of the respiratory centre are commoner causes of prolonged apnœa than is muscular paralysis following the administration of suxamethonium.

Aylesbury. OLIVER WALKER.

GRAVITATIONAL ULCER

SIR,—I was most interested to read at the end of Mr. Wright's article (Dec. 19) that he has successfully treated no less than 17 cases by ligation of incompetent perforating veins in the lower third of the leg. Since the publication of our article [1] calling attention to the importance of these veins in the ætiology of ulcer of the leg, a large-scale investigation into this subject has been in progress at St. Thomas's Hospital. In well over 100 cases of venous ulcer in which the sites of the ankle perforating veins have been explored, the following facts have been established:

(1) The anatomical position of the two upper inner ankle perforators, and of a large external ankle perforator (not described in our original paper) is remarkably constant and they can be approached with great accuracy, necessitating little subcutaneous dissection.

(2) The destruction or incompetence of the valve in the perforating vein can be demonstrated simply and easily by cutting across the vein. If the perforator's valve is incompetent, blood gushed out freely from the deep veins. If its valve is competent no bleeding occurs (Turner Warwick's test).

(3) Using this test we have shown that the great majority of ulcers *with* and *without* varicose veins have an incompetent perforating vein in their vicinity.

(4) In operating in this part of the leg great care must be exercised to prepare the skin, disperse œdema, and get the ulcer either healed or healing before the local exploration is done.

After the operation local support to the operation site with pad and elastic-webbing bandages is necessary from periods of two weeks up to a month to ensure firm healing. We have not operated on very extensive ulcers in old patients, preferring to control these by firm elastic support and massage. Under these conditions healing of the wounds in the lower third of the leg has not been a problem, and the wounds have remained healed, mostly without external support, after the initial period.

The results of this investigation so far corroborate Mr. Wright's statement that most gravitational ulcers are really postphlebitic (although we do not go so far as he does, to say that they *all* are).

Lastly, I should like to congratulate Mr. Wright on a paper which represents the increased interest and effort which is now being expended on understanding the pathology of these ulcers and on giving efficient treatment to that large body of patient sufferers from varicose veins and venous ulcers.

Department of Surgery,
St. Thomas's Hospital,
London, S.E.1. F. B. COCKETT.

"MOLLUSCUM PSEUDOCARCINOMATOSUM"

SIR,—Dr. Halnan (Dec. 26) asks "why not treat [molluscum sebaceum] as one would treat squamous carcinoma and eliminate all possibility of mistake?" Are we really still at the stage of using a sledgehammer to drive in every nail? Molluscum sebaceum, or as you so aptly called it, molluscum pseudocarcinomatosum, is a benign tumour which disappears spontaneously in a shorter time than the average common wart and causes no more discomfort to the patient. The diagnosis of molluscum sebaceum in the early stages is a little difficult, since then one has to rely almost entirely on the patient's history, but a small biopsy invariably enables one to make a firm diagnosis and avoid large doses of radium and/or X rays, and—equally important—having to give a guarded prognosis to a family doctor or relative and having to insist on a long follow-up. As I pointed out,[2] an excellent form of treatment consists in cutting off the top of the tumour and effecting hæmostasis with cautery. The fragment removed is invariably sufficient to enable histological confirmation of the clinical diagnosis, and the "feel" of the tumour when cut into is so

1. Cockett, F. B., Jones, D. E. E. *Lancet*, 1953, i, 17.
2. Beare, J. M. *Brit. J. Surg.* 1953, **41**, 167.

characteristic that a firm diagnosis can usually be made at this stage.

Dr. Halnan quotes a case of mine which was regarded as so good an example of the condition that photographs in colour were made, but yet on subsequent biopsy this tumour turned out to be a squamous carcinoma. Quite so—but the photographs were taken before the biopsy was made and the case was quoted by me to demonstrate the necessity for a biopsy in every case.

Dr. Halnan's case further demonstrates the fact that these tumours are benign and spontaneously healing.

Belfast. J. MARTIN BEARE.

FAIR PLAY FOR THE STAMMERER

SIR,—I read with interest the letter by Mr. St. John Rumsey in your issue of Dec. 19. The danger to which he alludes—namely, the overloading of speech clinics with dull dyslalic children to the exclusion of intelligent stammerers—is one that speech therapists must be careful to avoid. Since there are no definite rules regulating the selection of children for speech treatment from waiting-lists, when these exist, and since the responsibility for selection lies with the speech therapist, there is always the possibility of such a situation as Mr. Rumsey visualises. I do not consider, however, that the situation is so serious or so widespread as he suggests.

It is generally agreed among speech therapists that the educationally subnormal child cannot benefit from speech therapy until the age of 7 or until he has reached the mental age of 5, while many are best left to develop speech at their own pace without treatment. Children of this mental calibre may be admitted to the speech clinic for observation before the age of 7, since it is sometimes difficult to arrive at a differential diagnosis between deafness, psychosis, and mental defect. When poor intelligence is found to be the cause of dyslalia, treatment is generally discontinued or postponed until the child is of suitable age.

The dull child of below average intelligence generally suffers from emotional disturbance, being more conscious of his failure in performance. He is severely handicapped at school by reason of his speech and lack of confidence. Unless such a child receives speech therapy in time, he may altogether fail to benefit from the education provided in the classes of 40–45 children in the primary school. His plight, unless given help, is worse therefore than that of the feeble-minded child attending a special school. It can be argued in fact that the need of the dull child for speech therapy is greater than that of the stammerer, since the latter is able to compensate for his social handicap by intellectual achievement, as exemplified by the many doctors, scientists, &c., who stammer.

The majority of speech therapists nevertheless give priority to stammerers, and whenever possible provide immediate treatment, despite what may be considered unfairness to the dull child. Such a case as that cited by Mr. Rumsey is, I believe, exceptional. There are not many school clinics which have a year's waiting-list, and I know of no hospital clinic in the London area where this is so. Vacancies for children needing speech treatment urgently can generally be found either in a school or hospital clinic as happened in fact in the case of the child mentioned. Failure to obtain treatment depends, not so much upon the lack of discrimination on the part of speech therapists, as upon parents, who in many cases are insufficiently interested to press for speech therapy. They labour under the misguided belief that their children will eventually "grow out" of the stammer and that it is a mistake to "draw attention" to it.

M. GREENE
Speech therapist to the Enfield Hospital Group and Hertfordshire School Health Service.

Harpenden, Herts.

DEXTRAN

SIR,—In your leading article of Nov. 7 you remark: "Kabat and Berg [1] suggest that the urticarial or allergic reactions observed after injecting dextran in normal people, or in patients, are probably caused by the presence of antibodies to dextran."

I respectfully wish to call your attention to the fact that this suggestion was originally made by my colleagues, Dr. James M. Neill and Dr. John Y. Sugg, and myself in 1950. Our reports, made for the specific purpose of calling attention to the immunological reactivity of dextran as a potential source of danger for persons who happen to have a high titre of dextran-reactive antibodies at the time of injection, were presented before the American Association of Immunologists,[2] the Harvard University Laboratory of Physical Chemistry related to Medicine and Public Health,[3] the National Research Council,[4] and the New York Academy of Sciences.[5]

Cornell University Medical College, New York, N.Y.

EDWARD J. HEHRE
Associate Professor of Bacteriology and Immunology.

RELATION OF CANCER TO MARRIAGE AND CHILDBEARING

SIR,—In Dr. Logan's excellent statistical analysis (Dec. 5) on the relation of marriage and childbearing to cancer of breast and uterus, there is one item the interpretation of which seems open to doubt. This is the conclusion that there is an increased risk of cancer of the breast in married women of childbearing age. The crude figures (table I in Dr. Logan's article) from which this conclusion is drawn are (mean annual death-rates per million women):

Age	*Single*	*Married*
15–24	1	1
25–34	21	33
35–44	236	200

The difficulty in interpretation arises from the steep upward slope of the mortality/age curve, and from the obvious fact that the proportions of age-groups 25–29 against age-groups 30–34 in the whole mean of the ten-year period analysed will be different for married and unmarried women—i.e., the group is marrying steadily from 25 to 35. This, in my view, requires a correction, which I have tried to supply with more or less arbitrary figures.

A regression of mortality on age within the ten-year period has been assumed as follows:

Age ..	25	26	27	28	29	30	31	32	33	34
Mortality ..	6·3	8·3	11·0	14·4	19·1	25·1	33·1	43·7	57·6	76·0

This is based on a linear logarithmic progression of the yearly mortality and will approximately fit into the general trend observable in Dr. Logan's table. By dividing the ten-year period into two five-year periods two arithmetical means can be calculated—11·8 for the 25–29 group and 47·1 for 30–34.

A rather less certain assumption was then necessary to complete the argument: if 70% of the younger age-group and 90% of the older group are married, the expected mean death-rates for single and married women can be calculated for the ten-year period. Thus:

$$\frac{(70 \times 11{\cdot}8) + (90 \times 47{\cdot}1)}{(70 + 90)} = 31{\cdot}7 \text{ (for married women); and}$$

$$\frac{(30 \times 11{\cdot}8) + (10 \times 47{\cdot}1)}{(30 + 10)} = 20{\cdot}6 \text{ (for single women).}$$

These ten-year means do, in fact, closely approximate to Dr. Logan's findings. The conclusion that there is an increased risk of cancer of the breast in married women of childbearing age, however, does not seem warranted because the calculation is based on the assumption that the death-

1. *J. Immunol.* 1953, **70**, 514.
2. *Fed. Proc.* 1950, **9**, 383.
3. Separation of the Formed Elements, the Protein, Carbohydrate, Lipid, Steroid, Peptide, and Other Components of Plasma. Boston, 1950; article 7.
4. Conference on Dextran and Polyvinyl Pyrollidone. Washington, Jan. 30, 1951; p. 119.
5. *Ann. N.Y. Acad. Sci.* 1952, **55**, 467.

rates are equal in both groups of women. It might well be possible that an exact analysis, based on the true proportions of married and single women within the crucial ten-year period, would show that the general lifelong trend of a reduced risk of cancer of the breast in married women will hold true even among those of childbearing age. Such an analysis could be made by a differential combination of the negative regression of the proportion of unmarried women and the positive regression of mortality on age. And it would in fact be a completion of the argument used by Dr. Logan in calculating what he termed "*equivalent* average death-rates for females aged 15 or more," the only difference being that his ten-year periods would be divided into one-year periods at the critical ages.

What I have said in my arbitrary example could, of course, be applied in the same way to table III of Dr. Logan's article, which deals with the death-rates in single, married infertile, and married fertile women, for the proportion of parous women also shows a positive regression on age.

That the over-all risk of cancer of the cervix is greater in married than in single women is not to be denied, but my proposed correction would minimise the difference in mortality between single and married women, at least in the younger age-groups (see Dr. Logan's table v).

Berlin. P. KÜHNE.

THE TELESCOPE IN MEDICINE

SIR,—I am not convinced that, as Dr. Alice Stewart argues in her letter (Dec. 19), more accurate definition of "Social Medicine" is required in order that the medical profession should appreciate the contribution the subject has to make to medical practice and research. There appear to me to be two important reasons for the present lack of appreciation, and for the difficulties of recruitment which so greatly handicap those working in this branch of medicine.

The first is that the establishment of separate departments of social and preventive medicine in many provincial schools, and their total absence from the London schools, has emphasised the misconception that medicine is solely a clinical subject to be learnt and practised only upon patients who come to hospital or consult their doctors. It should as much concern itself with those who, while still unaware of any illness, are in fact the subjects of early deviations from health which if uncorrected will ultimately lead to symptoms and bring them to the clinician, too late, in many cases, for effective treatment. The second reason is that clinical practice and research appear to provide much more immediate personal satisfaction than community study. The clinician can himself apply the fruits of his research whereas, in Professor Crew's phrase, "the pharmacy of Social Medicine is the House of Commons." To prescribe through this pharmacy may be frustrating, and the prescriber receives no thanks from those he benefits though they may be numbered in thousands as against the clinician's scores.

The student, and hence the practitioner, has all the glamour of clinical practice dangled before him, and sees research as a purely laboratory activity. This restriction in outlook is well seen in the programmes of our learned medical societies, the majority of which are entirely concerned with what Sir James Spence has aptly called "medical phenomenology." The great range of urgent problems awaiting study in the field lie neglected.

Surely a department of medicine should extend its activities to the whole subject and not confine itself to one branch. Not everyone, it is true, can master the techniques of both clinical and field practice and research. There must be members of the department competent in each field, but let them work *within a single department*, fertilising each other's thoughts by daily discussion of their complementary approaches and showing medicine in its full span as a unity to their students. We already have pioneers of this integrated activity. Prof. Dugald Baird in Aberdeen and Prof. Sir James Spence in Newcastle have shown that clinical departments can extend their research and practice into the community they serve and contribute to knowledge in a way that would have been impossible within the confines of their wards.

I would thus plead, not for separating off yet another narrow specialty of "statistical ætiology," but for bringing back into medicine an essential part that has been unwisely separated off and neglected.

Richmond Green, Surrey. C. M. FLETCHER.

SIR,—Surely the kind of medical investigation that Dr. Alice Stewart likens to astronomy is best called epidemiology—the study of disease among the people. Social medicine has a wider connotation: it is, as one definition has it, the kind of medicine practised by the good family doctor and includes not only the ætiology and diagnosis but also the treatment of disease in a particular environment. Epidemiology is mainly concerned with ætiology and diagnosis and is comparable in this respect to "clinical science," but with the community, not the individual, as its patient. As recently pointed out by Prof. T. Francis,[1] there are many points of analogy in the study of disease in the individual patient and in the community, and it seems a great pity that clinical epidemiology is not practised and taught much more in our medical schools than is at present the case. This method of investigation has had its greatest successes in the fields of infectious diseases and nutritional disorders but is now being extended by small bands of enthusiasts to other medical problems. It is particularly important that the clinical departments of our medical schools be actively engaged in such studies, for the clinician is the student's hero and by early indoctrination the doctor of the future will learn that there is more in medicine than the diagnosis of an "interesting case" isolated in a hospital bed.

Wright-Fleming Institute of Microbiology, St. Mary's Hospital Medical School, Paddington, London, W.2. ROBERT CRUICKSHANK.

PROLONGED GENERALISED VACCINIA

SIR,—As you mention in your annotation last week, one of the interesting points of prolonged generalised vaccinia is the failure of specific antibody formation. In addition to our case quoted by you, Keidan et al.[2] have since published a similar fatal case, but—and this is the interesting additional feature—besides showing the absence of specific antibody, they found their patient's serum to be devoid of gamma-globulin when submitted to paper electrophoresis. The serum on which this estimation was done was stored for seven months, but at —78°C, so that the result is probably valid.

Bruton,[3] in America, first reported a patient who had had 19 "episodes of clinical sepsis" and in whom "agammaglobulinæmia" was found. Several other American workers have obtained similar results in children suffering from repeated severe infections. This may be an important finding, since Bruton's patient was free of his "episodes" for at least fourteen months after receiving monthly gamma-globulin injections; such injections might well prove life-saving if given early to patients with prolonged generalised vaccinia, which is, as you say, fortunately a rare disease.

Because of the above findings, I have kept a watch on children who have had repeated severe infections and I have sent their serum for gamma-globulin estimation.

1. *Amer. J. med. Sci.* 1953, **226**, 376.
2. Keidan, S. E., McCarthy, K., Hawarth, J. C. *Arch. Dis. Childh.* 1953, **28**, 110.
3. Bruton, O. C. *Pediatrics*, 1952, **9**, 722.

So far, 9 patients have been investigated, including 1 who has had bacteriologically proved pneumococcal meningitis seven times and in whom no anatomical abnormality has been found. In all of them the serum gamma-globulin has been normal. It would be interesting to hear of others' experiences in this field.

Bristol Royal Hospital for Sick Children. BERNARD LAURANCE.

MELAMINE RESIN IN THE MAKING OF PLASTER CASTS

SIR,—I write to confirm Dr. Morrison's remarks (Dec. 19) about the use of resin-soaked plaster bandages.

I have given 'Beetle Resin' a thorough trial during the past few months in the fracture clinic at the Royal Free Hospital. Plasters made with this resin are lighter, stronger, cheaper, and more durable than plasters made without it. Preparation of the solution is simplified by using measures which will hold known weights of resin, ammonium chloride, and tepid water. There have been no toxic effects.

Royal Free Hospital, London, W.C.1. ROY H. MAUDSLEY.

LACTATION AND FLUID INTAKE

SIR,—Professor Illingworth and Dr. Kilpatrick end their article (Dec. 5) with an appeal for the abandonment of traditional methods, claiming the support of a "negative correlation coefficient" between intake and output of "all the mothers"; they also state that "there was evidence that more milk was produced by mothers who only drank enough to satisfy their needs"—an opinion repeated in your leading article.

The observations presented are analysed by 13 tests of significance, of which 1 is significant, and by 6 tests for correlation, of which 1 is significant. The level of significance adopted is 5%, or such that 1 test in 20 would be expected to be falsely significant. In 13 tests of significance at that level, 1 or more significant results would be expected in about 50% ($100\,[1 - 0{\cdot}95^{13}]\%$), and in 6 tests for correlation one or more would be expected to be significant in about 25% ($100\,[1 - 0{\cdot}95^{6}]\%$) of sets of observations analysed, when there was, in fact, no association whatever between the groups into which they were divided.

The "negative correlation coefficient" appears, in the text, to relate only to the forced drinkers. The free drinkers showed almost as large a positive correlation which, although it does not cross the arbitrary threshold of significance, mildly suggests they did not drink enough. Even if this "negative correlation coefficient" between intake and output of the forced drinkers is to be considered significant, the explanation is not necessarily physiological. Since many of these drinkers apparently did not reach their daily target of six pints the coefficient may also be regarded, in the absence of other evidence, as correlating negatively therapeutic obedience with satisfactory lactation.

The statement that "there was evidence that more milk was produced by mothers who only drank enough to satisfy their needs" is apparently derived by extending the significant results of a minority of women with heavy babies to include the majority of others who, in fact, showed the opposite tendency. Even if this difference is to be regarded as significant, it would appear dangerous to draw general conclusions from it, firstly, because it relates to a minority and, secondly, because this minority might be suspected of containing a few women with an abnormal hormonal background, as in incipient diabetes, who, if unevenly distributed between the groups, might unduly disturb one average. If they were evenly distributed, such a subpopulation might invalidate the "t" test.

The significant associations attributed to these observations cannot be considered such as would not be expected to arise frequently through chance alone. Nor can that part of the available observations on which these significant associations were found, even if they were to be accepted as significant and free from alternative explanations, be considered directly relevant to the main argument, which I take to be whether or not forcing fluids accelerates the growth of infants. Any conclusion based on the weight of milk must presuppose an independence of its quality and quantity, since only the latter is measured.

The information contained within such a large and carefully controlled series of observations is undoubtedly adequate to demonstrate at a significant level any appreciable influence from forcing fluids on infant growth, provided it is extracted by more efficient statistical methods. An analysis of the covariance of the weight at birth and at one month in both groups might be expected to decisively exploit this latent information.

London, W.1. J. H. EDWARDS.

*** We have shown Dr. Edwards's letter to Professor Illingworth, who replies as follows:

"The words which we used were: 'This investigation showed that not only does the forcing of fluids have no beneficial effect in increasing milk production, but also that it may have a harmful effect and reduce it.' We would certainly agree that the evidence that forced fluids have a harmful effect on lactation is slender: hence the word '*may*,' which we felt justified in using for a result significant at the 5% level, and we think that many statisticians would agree with this. The point of the paper, however, lies not in this possibility, which requires further investigation, but in the unequivocal finding that the forcing of fluids, which is a nuisance to the nursing staff and troublesome for the patient, was useless."

THE LIFE OF THE SHAWL

SIR,—I would venture briefly to supplement the clinical picture of Darwin drawn by Dr. Hubble (Dec. 26). To begin with, Darwin did not present any clear-cut psychiatric picture from the point of view of symptoms. His illness was compounded of depressive, obsessional, anxiety,[1 2] and hysterical symptoms which, for the most part, coexisted, though he appears to have gone through phases when one or other group of symptoms predominated for a time. Further, there is a wealth of evidence that unmistakably points to these symptoms as a distorted expression of the aggression, hate,[3] and resentment felt, at an unconscious level, by Darwin towards his tyrannical father, although, at a conscious level, we find the reaction-formation of the reverence for his father which was boundless and most touching. At the same time, the symptoms represent, in part, the punishment Darwin suffered for harbouring such thoughts about his father. For Darwin *did* revolt against his father. He did so in a typical obsessional way (and like most revolutionaries) by transposing the unconscious emotional conflict to a conscious intellectual one—concerning evolution. Thus, if Darwin did not slay his father in the flesh, then in his *The Origin of Species*, *The Descent of Man*, &c., he certainly slew the Heavenly Father in the realm of natural history. (There is good evidence that Robert Waring, Darwin's father, was inimicably disposed to Erasmus, his father and Darwin's grandfather, as a man and to his heterodox scientific views, including evolution.)

This revolt of Darwin can be traced back to Darwin's extramural scientific activities at Edinburgh, in particular to Dr. Grant's bursting forth in high admiration of Lamarck and to Darwin's discovery about the *Pontobdella muricata*. Regrettably, information is scanty, but Darwin's neurotic symptoms were definitely present a little later when he was studying for the church at

1. Kempf, E. J. Psychopathology. London, 1921.
2. Hubble, D. *Lancet*, 1943, i, 129.
3. Hubble, D. *Horizon*, 1946, **80**, 74.

Cambridge and took the form of an occasional attack of palpitation and a definite recrudescence of his childhood obsessional symptoms. Thus his symptoms began before he even knew of the existence of the *Beagle*, though, of course, it was on the voyage of the latter that the revolt (and his symptoms) took a definitive course.

As in the case of Œdipus, Darwin's punishment for the unconscious patricide was a heavy one—almost forty years of severe and crippling neurotic suffering which left him at his very best fit for a maximum of three hours' daily work. In the same connection, it is interesting to note that Darwin married one who (even before his marriage) was, for the most part, a good-mother figure to him.

Lastly, I doubt very much if the usual general picture of Darwin as a kindly, tolerant father in an atmosphere of uninterrupted love and affection is correct in its psychological essentials. There is a terrible tyranny that can accompany chronic illness, and by his (undoubtedly unconscious) exploitation of the secondary neurotic gain from his primary illness, he assuredly tyrannised it over his own family every bit as effectively as the mighty Erasmus or Robert Waring had done. The chronic strain his children must have undergone living in such an atmosphere [4] must have contributed not a little to their latter dispositions. There is, in addition, evidence of psychological misunderstanding of a considerable degree in one of his children and, not only so, but positive mishandling in the matter of the potential production of subsequent symptoms.[5]

Shotts, Lanarkshire. R. GOOD.

MILDMAY MEMORIAL HOSPITAL

SIR,—For thirty years the maternity unit at the Mildmay Memorial Hospital has served a useful function in the Islington, Hackney, and Stoke Newington areas.

Two weeks ago the unit was closed at forty-eight hours' notice and 230 patients who had been booked for admission were informed that they would have to be transferred to other hospitals.

During these thirty years, general practitioners have been able to attend their own patients in this hospital, and closure removes the only opportunity for such liaison in this district.

As the Ministry of Health a year ago expressed a desire to purchase the property from the Mildmay Trustees and an agreed value was fixed, the problem could easily be solved in this way. Failing this, we demand that alternative accommodation in other hospitals be provided so that G.P.s may attend their own cases.

W. COHEN-ANDRÉ P. A. M. SOUTTER
J. C. MCGREGOR C. F. STOTT
M. E. MORTON M. O. THORPE.

London, N.4.

LANGUAGE OF THE HEART

SIR,—Both "Sir Daniel Whiddon" (Dec. 19) and Dr. Vertue (Jan. 2) have written deprecating the use of the terms *valvulotomy* and *valvotomy* to describe the surgical procedure adopted for the relief of mitral stenosis; they do so with justice on the ground that the words represent a mixture of two noble languages. Further, they admit that *sanidotomy* and *saridotomy*, which they themselves propose as alternatives, have the disadvantage of unfamiliarity; even so they are a fair match for *commissurotomy* which has gained acceptance in America.

The Greek letter β is the equivalent of the English V, and the Greek word βαλβίς (genitive, βαλβιδος) has the same meaning as *valve* in English and is the word customarily used in Greek medical literature to designate this anatomical unit. It seems natural, therefore, to adopt *valvidotomy* as the appropriate name for the surgical correction of obstruction at the heart valves.

London, W.1. WILLIAM EVANS.

SHUNTING IN THE HUMAN KIDNEY

SIR,—Professor De and Dr. Sengupta conclude their letter of Sept. 26 with the plea for the collection of further data on this important subject, on which Professor De has himself provided valuable evidence elsewhere.[1] Towards this end, certain facts need recording.

An essential part of the Trueta mechanism is the preliminary narrowing of the renal artery itself.

In a previous communication,[2] I drew attention to a report by Handler [3] of a case of concealed accidental hæmorrhage in which both cæsarean section and embolectomy were urgently called for—the embolectomy for a suspected fresh embolus in the right common iliac artery. At operation, the internal and external iliac arteries were in spasm and pulseless but they soon recovered after lumbar sympathectomy. Many instances of such an association were later brought to Handler's notice,[4] especially by French clinicians. The detection in the living subject of vascular spasm so located and accompanying a condition known to provoke renal ischæmia (in which the pattern of the Trueta diversion has been shown to occur) was highly significant, and its resemblance to the experimental findings could not be ignored. Since then a report [5] of a renal biopsy in a case of obstetric anuria has been published, revealing cortical ischæmia and medullary congestion.

Recently, Professor Louw [6] stated that, during a cæsarean section in a case of concealed accidental hæmorrhage, he saw the renal artery in unmistakable spasm. This observation of an essential part of the Trueta mechanism in a potentially pre-anuric state is very significant, and must imply that diversion of renal blood-flow was also taking place.

Certain indirect evidence can also be offered. Goetz [7] found that, even after a successful Smithwick operation in a young woman who had previously had a high blood-pressure, subsequent pregnancies were accompanied by pre-eclamptic toxæmia demanding termination, which immediately cured her. As a corollary, Theobald,[8] employing what amounted to complete denervation of the uterus, succeeded in preventing the supervention of pre-eclampsia in the hypertensive. Assuming that the kidney is largely responsible for the hypertension, it may be inferred that a successful Smithwick operation insulates it against most forms of stimulation, except those arising in pregnancy. To interrupt these stimuli, uterine denervation appears to be effective, implying the existence of a uterorenal pathway and a reflex mechanism that may traverse it.

This assumption is supported by the correlation of experimental and clinical research using the ergot derivatives.

Rothlin and Cerletti,[9] in testing various experimental methods of vasoconstriction, have shown that the kidney responds to them with ischæmia. But previous administration of ergot derivatives succeeded, presumably by sympatholytic action, in preventing this ischæmia. On the clinical side, Rupp,[10] in dealing with 60 cases of toxæmia, found that 'Hydergine' (a mixture of ergot derivatives) reduced the blood-pressure to normal in 51 and lowered it in 7. Pathological eyeground changes, occurring in 32 patients, were

4. Darwin, C. The Origin of Species. London, 1947; p. vi.
5. Darwin, C. Mind. London, 1877; p. 285.

1. De, S. N. *J. Indian med. Ass.* 1953, **23**, 60.
2. Sophian, J. *Brit. med. J.* 1952, i, 382.
3. Handler, J. J. *Lancet*. 1949, ii, 514.
4. Handler, J. J. Personal communication, 1949.
5. Jeffcoate, T. N. A. Cited by Franklin, K. J. *Proc. R. Soc. Med.* 1950, **43**, 467.
6. Louw, J. T. Personal communication, 1953.
7. Goetz, R. H. Personal communication, 1953.
8. Theobald, G. W. *Brit. med. J.* 1953, i, 422.
9. Rothlin, E., Cerletti, A. *J. Mt Sinai Hosp.* 1952, **19**, 138.
10. Rupp, F. *Gynæcologia*, 1953, **135**, 390.

overcome in 27 and improved in 3. Symptoms as a whole were ameliorated within a few hours. The drug had a remarkable effect on oliguria and anuria, proving curative in some cases. Szirmak [11] and his colleagues, using the same treatment in 15 patients with presumable toxæmia, found that symptoms were considerably improved and convulsions ceased rapidly in 4 cases of eclampsia. Again, Alha and Montell [12] treated 46 cases of toxæmia with hydergine: the blood-pressure fell and the albuminuria diminished in 17, and the urine volume increased in 22.

Bearing Rothlin's experiments in mind, there is, therefore, evidence that ergot derivatives owe their therapeutic value to this property of overcoming renal ischæmia. Further support of this view is provided by the diuresis they evoke. Renal ischæmia and not adrenal cortical activity is overcome. Renal ischæmia in pre-eclampsia is said to occur as a result of the utero-renal reflex [13] (no demonstrable toxin has ever evoked this change). The accompanying diversion of blood-flow according to the Trueta or Oxford pattern is apparent in certain cases of fatal eclampsia. By interpolation, it may be reasoned that pre-eclampsia is based on earlier stages of the mechanism [14] and that its severity is in proportion to the stage reached.

The sum of this indirect and recent evidence, therefore, supports the existence of the Oxford blood-flow diversion in the kidney and provides the further data that were asked for.

London, W.1. JOHN SOPHIAN.

CONGENITAL KERNICTERUS

SIR,—I have a patient, aged 55, who is suffering from congenital kernicterus. As this condition may not be known at this age, I feel it is worth recording. The condition has only just been recognised because, of course, at the time he was born the rhesus factors were not understood.

His own blood and that of his father are both rhesus-positive, while his mother's blood is group A and rhesus-negative. He has an elder brother who is well. His mother had a number of miscarriages after he was born.

He was born jaundiced and had jerky movements of the limbs in the first week of life. At the age of 7, abnormal motor developments were noticed, and now he is peculiar in his movements, and he is cyanosed owing to paralysis of the left diaphragm. Mentally, he is a borderline defective. He is, of course, unable to lead a normal life, and, owing to considerable motor abnormalities, he is unable to walk very far.

He was fully investigated at the National Hospital for Nervous Diseases, where he was under the care of Dr. William Gooddy.

Petworth, Sussex. W. A. BALL.

MYXŒDEMA ATTRIBUTED TO IODIDES

SIR,—Dr. Morgans and Dr. Trotter [15] suggest that, in certain individuals, large doses of iodides, especially when administered intermittently, may cause myxœdema. The following brief case-history, describing another patient in whom hypothyroidism has developed apparently as a result of intermittent administration of iodides, would support their hypothesis.

A man, aged 65, had been suffering from increasing breathlessness, due to bronchitis and emphysema, for ten years. At times severe dyspnœic attacks would be followed by the expectoration of thick tenacious mucoid sputum. A year ago he had been advised to take potassium iodide (gr. 18 q.i.d.) for four days, alternating with three days' abstention from the drug. During the past three months there has been increasing huskiness of the voice and for the first time the bowels have been stubbornly constipated. The facies is now myxœdematous. The serum-cholesterol level is 370 mg. per 100 ml.

It would seem probable that, as Dr. Morgans and Dr. Trotter suggest, further cases will be detected now that the syndrome has been described.

E. M. HERBERT
London, W.1. E. PETRIE.

BRONCHIAL NEOPLASM WITH MYASTHENIA

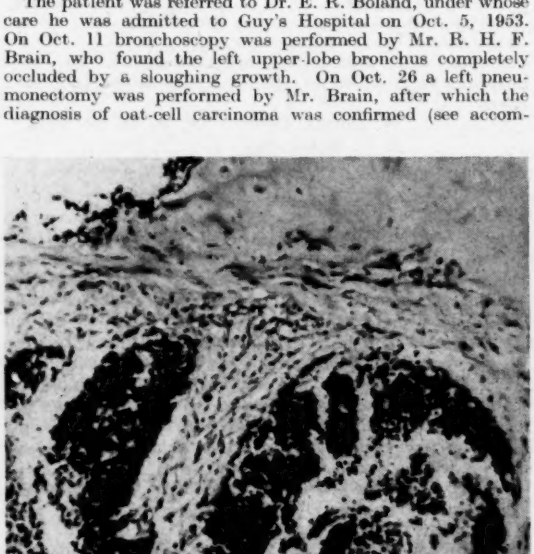
SIR,—I was most interested in the account of bronchial neoplasm with myasthenia, given by Dr. Anderson and his colleagues (Dec. 19). I have recently observed a very similar case, the main clinical features of which, perhaps, merit brief record.

A man, aged 51, first reported on July 24, 1953, complaining of generalised weakness which had been developing for about six weeks and which had been precipitated, in the patient's view, by an incident in June, 1953, when he was lifting a crate of bottles and experienced a sharp pain in the left chest anteriorly. This severe pain was transient but gave place to a dull ache which had remained. Since this day he had noticed progressive weakness of the limbs so that, as the day wore on, he found increasing difficulty in using his arms in his job as a stoker and by evening could scarcely lift a towel to his face. The legs became so weak at the end of the day that he could only climb the stairs to his flat by dragging himself up on the banisters. There had been no diplopia, no difficulty in chewing or swallowing, and no dysarthria.

He had a partial bilateral ptosis which he had had all his life. Apart from slight proximal weakness of the arms, there were no other abnormal signs on neurological examination. No undue fatigability was conclusively demonstrated, but the story was suggestive of myasthenia gravis and an injection of neostigmine (2 mg.) was given, preceded by atropine (gr. $^1/_{100}$). This produced a dramatic improvement in the patient's well-being so that, on his return home, as he reported later, he ran up the stairs, the first time he had done so for several weeks. In view of the response observed, before his departure from the outpatient clinic, neostigmine tablets (30 mg.) were prescribed, four-hourly, except at night, for fourteen days. He attended again on Aug. 7, when he reported that the tablets had been of some help, but compared with the injection they worked more slowly and not to the same extent.

In view of the unusual nature of the myasthenia, closer attention was now paid to the patient's symptom of cough. This had taken him to his doctor earlier in the year, and he had had a chest radiograph two months previously which had been reported as normal. A repeat picture now showed partial collapse of the left upper lobe, with displacement of the trachea and upper mediastinum to the left.

The patient was referred to Dr. E. R. Boland, under whose care he was admitted to Guy's Hospital on Oct. 5, 1953. On Oct. 11 bronchoscopy was performed by Mr. R. H. F. Brain, who found the left upper-lobe bronchus completely occluded by a sloughing growth. On Oct. 26 a left pneumonectomy was performed by Mr. Brain, after which the diagnosis of oat-cell carcinoma was confirmed (see accom-



11. Szirmak, G., Horvath, B. *Mag. Noorv. Lapja*, 1951, **14**, 315.
12. Alha, A. L., Montell, Y. *Excerpta med. Amst.* 1953, vol. 6, no. 11; section 10, 2030.
13. Franklin, K. J. *Lancet*, 1952, ii, 1141.
14. Sophian, J. Toxæmias of Pregnancy, London, 1953; p. 39.
15. Morgans, M. E., Trotter, W. R. *Lancet*, 1953, ii, 1335.

panying figure). During and after this operation, the anæsthetist found that the patient behaved exactly as a myasthenic, in that he was very sensitive to anæsthetic drugs, and easy to control but difficult to revive, even with neostigmine.

It is too early to say whether the operation has had any influence on the myasthenia.

The association of myasthenia and carcinoma of the bronchus in a patient who presents with myasthenia must be extremely rare, and, in addition, one that is not likely to be overlooked, because, in patients with myasthenia gravis, the chest is radiographed in almost every case to see whether there is a thymic tumour. It is, however, possible that in patients whose bronchial carcinoma presents in a more usual way, careful inquiry may elicit mild symptoms of myasthenia which may be relieved by administration of neostigmine.

I am grateful to Sir Charles Symonds, Dr. E. R. Boland, and Mr. R. H. F. Brain for permission to make this report.

Neurological Department, Guy's Hospital, London, S.E.1. IAN MACKENZIE.

SIR,—The letter by Dr. Mackenzie, which I believe you are publishing this week, prompts me to offer additional information which may be of interest to anæsthetists. The clinical details of the case are dealt with in Dr. Mackenzie's letter.

Following an intramuscular dose of 30 mg. of neostigmine two hours before operation, pre-medication with 'Omnopon' (gr. $^1/_3$) and scopolamine (gr. $^1/_{150}$) was given one hour, and an amethocaine lozenge (gr. 1) ten minutes, before commencing anæsthesia.

After cocainisation of the larynx, the patient was induced with thiopentone sodium (0·4 g.), a Magill no. 10 cuffed endotracheal tube was inserted, and semi-open gas-oxygen (5 litres/2 litres) was administered, using a Waters canister. Cyclopropane was added in small amounts (100–200 c.cm. per min.) to the mixture on the few occasions during maintenance when slight increases in depth were required, but it was never given for more than five or ten minutes at a time.

Five minutes before incision of the pleura, controlled respiration was initiated with great ease by intermittent compression of the rebreathing bag, but without the use of any relaxants. It was then extremely easy to control respiration on the mixture described above. At no time during removal of the lung or the subsequent repair of the bronchial stump was there reflex "coughing," which is quite a common incident in the inadequately curarised normal subject.

The patient's general condition remained satisfactory throughout the operation. The colour was good, the systolic blood-pressure varying between 100 and 130 mm. Hg, and the pulse-rate between 80 and 108 per min. Blood replacement, estimated from measured blood-loss, amounted to 1030 g.

During closure, difficulty was experienced in re-establishing spontaneous respiration. Atropine sulphate (gr. $^1/_{75}$) was given intravenously, followed five minutes later by intravenous neostigmine (2·5 mg.). Since apnœa was still complete, a further 2·5 mg. was given five minutes later, followed by a further 2 mg. ten minutes after that. Extremely shallow spontaneous respirations then began, resembling those seen in a normal, well-curarised patient. During the next thirty minutes a further total of 10 mg. of neostigmine, given in divided doses of 2·5 mg., produced no further increase in tidal exchange. At no time during this period did the patient's general condition give rise to anxiety. Blood-pressure remained within the above limits, and no definite bradycardia or salivation was noted. Assisted respiration with oxygen was given throughout.

No further drugs were given during the next hour, at the end of which time the patient began to move his head and open his eyes; almost simultaneously, respirations deepened and within a minute or so were sufficiently deep to allow unaided breathing to continue, a good colour being maintained without oxygen. After a further ten minutes' observation the patient was allowed to return to the ward.

The behaviour of this patient under anæsthesia is considered typical of what may be expected in a myasthenic. The small dosage of all agents used (except neostigmine) to maintain adequate conditions for a thoracotomy lasting three and a quarter hours tallies closely with the general opinion that tolerance of anæsthetic drugs in these patients is very low. With this patient, we deliberately avoided muscle relaxants (particularly of the curare type), and it seems that their use might well have resulted in a far more difficult and dangerous situation during recovery than was actually the case.

The reaction to the large dosage of neostigmine is interesting. It is probably explained by the increased tolerance to this drug usually found in these patients (and by this patient's preoperative course of neostigmine—30 mg. four-hourly by intramuscular injection). Certainly, increased tolerance might explain the poor respiratory response and the absence of side-effects. On the other hand, another possible explanation would support the view of Churchill-Davidson and Richardson [1] that in myasthenia gravis the motor end-plate responds to acetylcholine, decamethonium, and succinylcholine, first by depolarisation and then by competitive inhibition. If this is so, then it might be expected that the large amounts of neostigmine would perpetuate block of the depolarisation type initially (by allowing accumulation of acetylcholine), and would only become effective in re-establishing neuromuscular transmission when the block changed to that of the competitive-inhibition type.

I am grateful to Mr. R. H. F. Brain for permission to publish this account.

Department of Anæsthetics, Guy's Hospital, London, S.E.1. J. M. HALL.

SIR,—The report by Dr. Anderson and his colleagues indicated that the association of myasthenia and carcinoma of the bronchus had not been previously recorded; so your readers may be interested in the story of a patient I saw recently in whom there was a similar combination of features.

A man aged 43, first attended the outpatient department in October, 1952. He complained that his limbs became weak after relatively light exertion and that he had difficulty in swallowing; on two separate occasions he had been wakened from his sleep with severe breathlessness and on these occasions his voice had gone.

Examination revealed no significant abnormalities and it was considered that the patient was suffering from myasthenia gravis. Ten days later he developed acute respiratory distress and was admitted as an emergency. The weakness of his limbs and trunk was now worse, and he was unable to raise himself from the bed; the lower limbs could be lifted only a few inches and he was unable to raise the arms above the shoulder level. Dysphagia was pronounced and bilateral ptosis was evident. The loss of power of the respiratory muscles was producing severe dyspnœa, and râles were audible in both lung fields. The patient's attempts at coughing were ineffectual.

Following an injection of neostigmine, there was definite improvement in breathing, coughing, and muscular power; the ptosis disappeared and his voice became stronger, although he was now hoarse. Oral neostigmine (15 mg. tablets) was prescribed. The daily dosage required to control the muscular weakness was 22 tablets. A complete paralysis of the left vocal cord, which was in the abductor position, was detected, and a radiograph of the chest showed a mass in the left hilar region.

Three weeks after his admission, radiotherapy was instituted, and this resulted in the disappearance of the hilar mass. Coincident with this response, the dosage of neostigmine could be progressively reduced, so that the dosage became fixed at 4 tablets a day. Hoarseness persisted but no muscular weakness was now evident. Omission of neostigmine, however, was accompanied by a return of the ptosis, dysphagia, and weakness of the respiratory and limb musculature. The patient was discharged from hospital on Nov. 26, 1952, on a maintenance daily dosage of 4 neostigmine tablets.

1. Churchill-Davidson, H. C., Richardson, A. T. *J. Physiol.* 1953, **122**, 252.

His progress remained satisfactory until two months later when his condition rapidly deteriorated and he was admitted to a hospital in an adjoining area, where he died. Necropsy revealed a bronchial carcinoma with metastases.

Burnley. J. SHAFAR.

TUBERCULOSIS

SIR,—The fallacies of some of Mr. Pitcher's figures have been well illustrated [1]; but under certain conditions there may be some truth in his contention (Nov. 21) that the provision of "tuberculin-tested" (or pasteurised) milk leads to an increased incidence and mortality from tuberculosis. This view receives some support if the death-rates from tuberculosis in urban and rural areas are compared with the results of the National Tuberculin Survey,[2] both of which are summarised in the accompanying table. You have stated [3] that the higher proportion of positive reactors in rural children results from

DEATH RATES PER MILLION FROM TUBERCULOSIS IN ENGLAND AND WALES, MALES AND FEMALES, AND PERCENTAGE POSITIVE REACTORS IN NATIONAL TUBERCULIN SURVEY

—	Age-group	0–4		5–14		15–24	
		A*	B*	A*	B*	A*	B*
Deaths from respiratory tuberculosis	County boroughs and other urban districts	79	11·4	32	40·4	650	66·4
	Rural districts	37	20·3	27	49·4	418	65·0
Deaths from non-respiratory tuberculosis	County boroughs and other urban districts	318	11·4	106	40·4	56†	66·4
	Rural districts	244	20·3	72	49·4	56†	65·0

*A, figures summarised from tables 59 and 64 in the Registrar-General's Statistical Review for 1946–1947, Text, vol. I. B, Percentage positive reactors in Tuberculin Survey [2] at 5, 15, and 19–20 years of age respectively.
†15 years and over.

drinking unpasteurised milk from tuberculous cows. This statement is almost certainly correct; but, although the reaction-rate at five years of age was 1·8 times higher in *rural* than in urban areas, the death-rate in children up to four years of age, from respiratory tuberculosis, was 2·1 times higher in *urban* than in rural areas, and the death-rate from non-respiratory tuberculosis was 1·3 times higher in urban than in rural areas. The differences became smaller in the older age-groups.

I have recorded [4] what seemed to be an inverse relation in Great Britain between the incidence of bovine tuberculosis and the mortality from human tuberculosis. Even more striking results were obtained in the Scandinavian countries:

Madsen and his colleagues [5] examined nearly 3000 children in areas where tuberculosis occurred in cattle and 9000 in areas where it did not. The proportion of children who were tuberculin-positive was four times greater in an area where there was bovine tuberculosis than in an area where it had been controlled, but examination of hospital records showed that the proportion of children requiring treatment was twice as large in the regions where there was no bovine tuberculosis; and so was the proportion in which radiography showed changes in the lungs.

Holm and Holm [6] found that in towns with tuberculous milk 75% of children were tuberculin-positive at fourteen years of age, whereas in towns with tubercle-free milk only 20% were tuberculin-positive; but there was no more clinical tuberculosis among children drinking the tuberculous milk than among those drinking the tubercle-free milk. From this and other evidence Holm and Holm concluded that bovine milk infection is fairly harmless except in small children, whereas inhalation infection, whether human or bovine, is much more dangerous. They say that infection by tuberculous milk protects the children against tuberculous infection of the lungs. Drawing attention to the grave danger to which adolescents from tubercle-free areas are exposed when they meet respiratory infection in the towns, they advocate wide use of B.C.G., particularly in adolescents.

These facts did not, of course, retard the work on the control of bovine tuberculosis in the Scandinavian countries: bovine tuberculosis has now been eradicated from Denmark, and with the aid of B.C.G. and a vigorous anti-tuberculosis campaign the human mortality-rate from this disease continues to decline.

Obviously we have reached a stage of development where more and more countries are going to get rid of bovine tuberculosis. Thus Van den Born [7] has described how, at the instigation of the Dutch farmers, they and the Marshall Aid Administration contributed equal amounts to a five-year plan to eradicate the disease. Substantial parts of Holland are already free from tuberculosis and he expected that all important breeding regions would be free by November, 1953. "All bodies concerned with the scheme either farmers' organisations or official bodies are enthusiastically co-operating." This reminds one of Salmon's statement written in 1906, when he was the first chief of the U.S. Bureau of Animal Industry:

> "There can be no question that the great body of breeders desire to do what is right, and it would appear, therefore, that when a practicable plan of handling tuberculosis is demonstrated to them they will not hesitate in adopting it, but will rapidly suppress this disease and eradicate it from their herds."

The eradication of bovine tuberculosis is an important aid to beef and milk production in Great Britain and therefore to "public health": it is unreasonable to suggest, as Mr. Pitcher does, that one should allow the disease to persist (or fail to pasteurise infected milk) because the ingestion of tubercle bacilli may reduce the total morbidity and mortality from tuberculosis. Even if this were true, as it may be under certain conditions, the proper remedy would seem to be more vigorous efforts to control the human infection: in view of the facts outlined above it appears that immunological methods may be important.

Veterinary School, University of Queensland, Yeerongpilly, Brisbane, Australia. JOHN FRANCIS Professor of Preventive Medicine.

1. McKinstry, R. N. *Lancet*, 1952, i, 820.
2. Medical Research Council Survey. *Ibid*, p. 775.
3. *Ibid*, p. 804.
4. Francis, J. *Ibid*, 1950, i, 34.
5. Madsen, T., Holm, J., Jensen, K. A. *Acta tuberc. scand.* 1942, suppl. 6.
6. Holm, J., Holm, M. *Ibid*, 1945, **19**, 71.
7. Van den Born, J. M. *Int. vet. Congr.* 1953, part 1, vol. 1, p. 128.
8. The Registrar-General's Statistical Review of England and Wales for the Year 1952. Tables. Part I. Medical. H.M. Stationery Office. Pp. 368. 10*s*.

Public Health

The Registrar-General's Tables

THE Registrar-General has completed in record time his tremendous yearly task of analysing and tabulating twelve months' vital statistics for England and Wales. The volume [8] of medical tables for 1952 was published on New Year's Eve, and thus appeared, for the first time since the late war, within a year of the end of the period with which it deals. The current volume is over 100 pages shorter than its predecessor for 1951; and the changes include the disappearance of table 20, which last year occupied 119 pages. Table 20 analysed the causes of death at different periods of life, the causes being classified according to the Abridged List; and it included separate figures for the city of London, the Metropolitan boroughs, and the county boroughs, and totals covering the other urban districts and all the rural districts in each administrative county. This information has not been published this year, though the heading of the table is retained, and a note beneath

tells the disappointed reader that the details he is seeking can be obtained on request from the General Register Office. To compensate for this loss, table 21 has been enlarged: hitherto, this table has given a geographical analysis of the causes of death according to the Supplementary Abridged List, but with no classification by age-groups and no division of the administrative counties into urban and rural districts. This year, table 21 uses both the Abridged List and the Supplementary List, but it does not give the figures for each age-group. Some research-workers may miss this information, for it comes in handy in many different investigations; and the Registrar-General may be surprised by the number of people who ask him for table 20.

Some of the figures given in the tables have already been mentioned in the chief medical officer's report, which we summarised last month.[9] More than half the fatal accidents, other than road accidents, happened at home. During the year, there were 954 fatal accidents involving children under 15 in the home: the main causes were accidental suffocation by food or in bed (500), burns (147), poisonings (58), scalds (57), and falls (57).

The Registrar-General has also published a supplement[10] to his review of 1949, dealing with general morbidity, cancer, and mental health. This useful new feature of the review contains statistics from three sources: the general Survey of Sickness, based on monthly interviews of a representative sample of the adult population of England and Wales; the registration of cancer cases by hospitals; and records kept in mental hospitals and mental-deficiency hospitals. In the survey of general morbidity, the tables for 1949 show the ages of the sick people, where they lived, what work they did, how much they earned, and what illnesses they had.

Statistics from Certificates

The Ministry of Pensions and National Insurance have turned their formidable experience of medical certificates to good account by publishing a digest of statistics of incapacity, based on certificates sent to the Ministry in support of claims to sickness or injury benefit. The figures they have collected provide information not hitherto available about sickness in the working population. The first collection of statistics deals with the year 1950, and it is being sent to medical officers of health of counties, county boroughs, and large burghs, and to other people who have shown an interest in the Ministry's records. Other copies are available for those who would like them. The Ministry observes rather ruefully that, in making these analyses, they are dependent upon the diagnoses entered on the certificates by the doctors, who, they hope, will appreciate the importance of stating the cause of incapacity as accurately as possible.

9. See *Lancet*, 1953, ii, 1306.
10. The Registrar-General's Statistical Review of England and Wales for the Year 1949. Supplement on General Morbidity, Cancer and Mental Health. H.M. Stationery Office. Pp. 186. 7*s.* 6*d.*

Infectious Diseases in England and Wales

Disease	Week ended December			
	5	12	19	26*
Diphtheria	13	21	16	15
Dysentery	445	485	503	309
Encephalitis:				
Infective	2	1	3	3
Postinfectious	4	..	..	..
Food-poisoning	205	139	141	109
Measles, excluding rubella	886	883	778	611
Meningococcal infection	27	27	22	21
Ophthalmia neonatorum	31	35	30	30
Paratyphoid fever	1	5	4	1
Pneumonia, primary or influenzal	614	740	692	530
Poliomyelitis:				
Paralytic	49	46	39	19
Non-paralytic	16	13	12	10
Puerperal pyrexia	250	224	259	171
Scarlet fever	1549	1448	1284	949
Smallpox	..	..	..	..
Typhoid fever	3	1	1	..
Whooping-cough	2597	2758	2304	1424

*Not including late returns.

Notes and News

DISTRIBUTION OF VIOMYCIN

THE Ministry of Health reports that viomycin sulphate is being made available at the antibiotic distribution centres for use in suitable cases of tuberculous infection in N.H.S. hospitals. Viomycin is a streptomyces antibiotic, whose antituberculous activity was described in 1951.[1] A memorandum prepared by the Medical Research Council states that the main indication for its use is in selected cases of tuberculosis where the administration of all, or all but one, of the usual antituberculous drugs is impracticable. Even then viomycin should usually be withheld if chemotherapy is not clearly indicated and alternative methods of treatment are feasible (for example, in cases of minimal tuberculosis); nor is the use of this drug usually justified in the treatment of advanced and extensive lesions that are unlikely to respond to chemotherapy. Impairment of renal function and non-tuberculous renal disease are contra-indications.

A recommended regimen is intramuscular viomycin 2 g., in two doses of 1 g. on the same day, twice weekly. This is best combined with intramuscular streptomycin 1 g. twice weekly on the same days as the viomycin, or more often; or with oral sodium *p*-aminosalicylate 15–20 g. daily; or with isoniazid 200 mg. daily. The recommended duration of this treatment is three months. The patient should be in hospital, under close clinical observation and laboratory control.

The effects, though generally favourable, are less distinct than those from equal doses of streptomycin.

THERMOMETERS

THE description of a clinical thermometer as "½ min.," "1 min.," or "2 min." may mislead some people into believing that a dependable reading is obtainable in these times.[2] By the revised British standard for clinical maximum thermometers (B.S. 691/53) these times are not to be used on thermometers: instead the words "quick," "medium," or "stubby" are to be marked on them; and an explanatory slip with wording laid down in the standard is to be packed with each thermometer at the time of sale. "The inclusion of this slip," says the British Standards Institution, "should help in avoiding incorrect use of the thermometers, and this attempt at education has the backing of the manufacturers and the medical profession." Copies of the standard (price 2*s.*) are obtainable from the sales branch of the institution, 2, Park Street, London, W.1.

Fellowships in Clinical Research

The Medical Research Council invites applications for fellowships, tenable at centres in the United Kingdom during 1954–55, from medical graduates who wish to prepare themselves for a career in clinical research.

The awards will be made for one year in the first instance and will be renewable annually to a maximum of three years in all. Stipend will be at the rate of £850–£75–£1000 per annum, with superannuation. Applications must be sponsored by the head of the appropriate department in the candidate's university or medical school, and an undertaking will be required that a suitable academic post in a clinical department will be available to the candidate in that institution on satisfactory completion of the period of study under the fellowship. Forms of application may be had from the secretary of the council, 38, Old Queen Street, London, S.W.1, to whom they must be returned not later than March 1.

Nuffield Dental Fellowships

One of the aims of these fellowships is to enable graduates in medicine and science to qualify themselves to undertake teaching and research on dental health and disease. The annual value of a fellowship is between £500 and £800 a year. Further particulars will be found in our advertisement columns.

Shortage of House-officers

Impressed by the difficulty of obtaining house-officers, Wrexham Hospital Management Committee has decided, subject to approval by the Welsh Board of Health, to waive the normal salary for house-officers in order to get "locums" to take the posts.[3] The committee proposes to offer 12 guineas a week plus board and lodging; the usual salary is £8 a week less board and lodging. Mr. William Jones, the committee's secretary, said that of the 8 posts for housemen in the two Wrexham hospitals only 4 were filled.

1. See *Lancet*, 1951, i, 952.
2. *Ibid*, 1952, ii, 525.
3. *Liverpool Daily Post*, Dec. 8, 1953; *Wrexham Leader*, Dec. 11.

Employment of Disabled

The National Advisory Council on the Employment of the Disabled has been reconstituted by the Minister of Labour and National Service for a further three years. The chairman is Sir Brunel Cohen, and the new members include Sir Harry Platt and Dr. R. R. Trail. The following medical members were re-elected: Dr. J. J. R. Duthie, Dr. Maxwell Jones, and Dr. Donald Stewart.

A New Medical School at Sheffield

The board of United Sheffield Hospitals have announced (*Manchester Guardian*, Jan. 5) that by arrangement with the University of Sheffield a medical teaching school is to be built in the grounds of the Sheffield Royal Infirmary. The cost of the scheme is to be met by the university from a grant made by the University Grants Committee. The new building will include the professorial departments of surgery and therapeutics, laboratories, and a large lecture hall.

Training of District Nurses

The Minister of Health and the Secretary of State for Scotland have appointed a working party

"To consider what training it is desirable that registered nurses and enrolled assistant nurses, respectively, should undertake prior to their employment on home nursing duties, and the means by which such training should be provided."

Mr. I. F. Armor, deputy secretary of the ministry, is to act as chairman.

CORRIGENDUM: *Simpson Smith Lecture.*—In publishing Sir Clement Price Thomas's lecture last week we said that it was delivered before the West London Medico-Chirurgical Society. This was incorrect. The Alex Simpson Smith memorial trust is administered by the governing body of the West London Hospital Medical School. The school, not the society, is responsible for the lecture.

Diary of the Week

JAN 10 TO 16

Monday, 11th

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.1
5 P.M. Dr. J. T. Ingram: Significance and Management of Psoriasis. (Watson Smith lecture.)

MEDICAL SOCIETY OF LONDON, 11, Chandos Street, W.1
8.30 P.M. Dr. Richard Asher, Dr. T. A. Munro: Physical Basis of Mental Illness.

Tuesday, 12th

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
8 P.M. *Section of Psychiatry.* Prof. Alexander Kennedy, Dr. Maxwell Jones, Dr. Edward Glover: Psychopathy.

ST. MARY'S HOSPITAL MEDICAL SCHOOL, Paddington, W.2
5 P.M. Prof. Dugald Baird: Impact of Social Conditions on Labour.

INSTITUTE OF DERMATOLOGY, St. John's Hospital, Lisle Street, W.C.2
5.30 P.M. Dr. R. G. Cochrane: Leprosy.

CHELSEA CLINICAL SOCIETY
8.30 P.M. (South Kensington Hotel, 41, Queen's Gate Terrace, S.W.7.) Sir Francis Walshe, F.R.S., Dr. Denis Williams: Sleep.

MANCHESTER MEDICAL SOCIETY
8 P.M. (Medical School, University of Manchester.) *Section of Surgery.* Mr. Frank Nicholson: Surgical Treatment of Pulmonary Tuberculosis.

Wednesday, 13th

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2
5.30 P.M. Mr. R. Charles Evans, Dr. Michael Ward: Ascent of Mount Everest—Medical Studies. (Hunterian lecture.)

ROYAL SOCIETY OF MEDICINE
4.30 P.M. *Section of Physical Medicine.* Prof. W. C. W. Nixon: Psychosomatic Approach to Childbirth. Dr. Donald Wilson: Exercises in Antenatal and Postnatal Management.

ST. MARY'S HOSPITAL MEDICAL SCHOOL
5 P.M. Dr. D. F. O'Neill: Psychiatry lecture-demonstration.

INSTITUTE OF DERMATOLOGY
5.30 P.M. Dr. R. W. RIDDELL: Histopathology of Fungous Infections.

MANCHESTER MEDICAL SOCIETY
4.30 P.M. *Sections of Medicine and Pathology.* Dr. G. M. Barrett, Dr. A. G. Rickards: Brucellosis.

MEDICO-CHIRURGICAL SOCIETY OF EDINBURGH
8.30 P.M. (Royal College of Surgeons, Nicolson Street.) Dr. A. Rae Gilchrist, Dr. R. M. Marquis: Assessment of Patients for Cardiac Surgery.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW, 242, St. Vincent Street, Glasgow, C.2
5 P.M. Prof. L. J. Witts: Anæmia and the Alimentary Tract. (Finlayson lecture.)

Thursday, 14th

ROYAL COLLEGE OF SURGEONS
5 P.M. Prof. R. Milnes Walker: Place of Venous Shunts in Treatment of Portal Hypertension. (Hunterian lecture.)

UNIVERSITY OF LONDON
5 P.M. (Middlesex Hospital Medical School, Mortimer Street, W.1.) Prof. J. Pasteels (Brussels): Present Views on Embryonal Induction.

UNIVERSITY COLLEGE, Gower Street, W.C.1
4.45 P.M. Prof. Jean Brachet (Brussels): Rôle of Ribonucleic Acid in Morphogenesis.

BRITISH POSTGRADUATE MEDICAL FEDERATION
5.30 P.M. (London School of Hygiene and Tropical Medicine, Keppel Street, W.C.1.) Dr. E. A. Carmichael: Hemispherectomy and Localisation of Function.

ROYAL ARMY MEDICAL COLLEGE, Millbank, S.W.1
5 P.M. Dr. W. C. Cockburn: Early Field Investigations of Typhoid Vaccines.

BRITISH INSTITUTE OF RADIOLOGY, 32, Welbeck Street, W.1
8 P.M. Dr. J. Blair Hartley: Significance of Placental Calcification.

INSTITUTE OF CHILD HEALTH, The Hospital for Sick Children, Great Ormond Street, W.C.1
5.30 P.M. Dr. H. Davy: Behaviour in Epilepsy.

INSTITUTE OF LARYNGOLOGY AND OTOLOGY, 330, Gray's Inn Road, W.C.1
5 P.M. Prof. F. C. Ormerod: Use of Antibiotics and Chemotherapy.

ALFRED ADLER MEDICAL SOCIETY
8 P.M. (11, Chandos Street, W.1.) Mr. R. W. Raven: Psychological Reactions to Surgical Disease.

SURREY INTER-HOSPITAL PSYCHIATRIC ASSOCIATION, West Park Hospital, Epsom
7.30 P.M. Clinical meeting.

LIVERPOOL MEDICAL INSTITUTION, 114, Mount Pleasant, Liverpool, 3
3 P.M. and 8 P.M. Mr. Charles Evans: Everest, 1953.

UNIVERSITY OF ST. ANDREWS
5 P.M. (Medical School, Small's Wynd, Dundee.) Professor Witts: Anæmia and the Alimentary Tract.

Friday, 15th

UNIVERSITY COLLEGE
5.30 P.M. Prof. Werner Koll (Göttingen): Experimental Studies on Analgesics—Tooth Stimulation and other Methods.

POSTGRADUATE MEDICAL SCHOOL OF LONDON, Ducane Road, W.12
2 P.M. Professor Milnes Walker: Lesions of the Small Intestine.

ROYAL SOCIETY OF MEDICINE
4.30 P.M. *Section of Epidemiology and Preventive Medicine.* Dr. H. J. Parish, Miss M. Barr, Dr. J. Ungar, Dr. N. R. Butler: Combined Immunisation.
8.15 P.M. *Section of Radiology.* Dr. B. Strickland: Cushing's Syndrome. Dr. W. Copland: Bone Changes in Diabetes. Dr. J. Sheach: Enuresis.
8 P.M. *Section of Pathology.* Brigadier J. S. K. Boyd, F.R.S., Dr. E. McCloy, Dr. B. A. D. Stocker, Mr. W. R. Maxted, Dr. R. E. O. Williams, Dr. L. F. Hewitt: Phage Action on Bacteria.

FACULTY OF RADIOLOGISTS
2.15 P.M. *Radiodiagnosis Section.* (Royal College of Surgeons, Lincoln's Inn Fields, W.C.2.) Dr. P. G. Keates: Physical, Physiological, and Hormonal Aspects of Hydronephrosis. Dr. Conway Don: Bronchography in Pulmonary Tuberculosis.

INSTITUTE OF DERMATOLOGY
5.30 P.M. Dr. Cochrane: Leprosy.

OSLER CLUB OF LONDON
7.45 P.M. (11, Chandos Street, W.1.) Prof. J. M. R. Cormack, M.A.: Black Magic.

Saturday, 16th

BIOCHEMICAL SOCIETY
11 A.M. (Postgraduate Medical School of London, Ducane Road, W.12.) Scientific Papers.

Appointments

BOYD, WILLIAM, M.D. Edin.: senior registrar in mental deficiency and child psychiatry, Little Plumstead Hospital.

DAVIES, G. L., M.R.C.S., D.P.M.: asst. psychiatrist, Ipswich child psychiatry clinic.

HEATON-WARD, W. A., M.B. Brist., D.P.M.: superintendent, Stoke Park Colony Group, Bristol.

VINCENT, C. T., M.B.: asst. clinical pathologist, North Gloucestershire clinical area.

Newcastle Regional Hospital Board:

LEAMING, H. L., M.R.C.S., D.A.: consultant anæsthetist, Tees-side H.M.C. group.

RYAN, PATRICK, M.B. Dubl.: asst. chest physician (S.H.M.O.), Poole Hospital, Middlesbrough.

SLACK, C. C., M.CH. Orth. Lpool, F.R.C.S.E.: asst. orthopædic surgeon, Sanderson Orthopædic Hospital, Gosforth.

North East Metropolitan Regional Hospital Board:

CHOYCE, D. P., M.B. Lond., F.R.C.S., D.O.M.S.: part-time ophthalmic surgeon (consultant), Southend General, Rochford General, and Runwell Hospitals, and Southend eye clinic.

CRAWFORD, A. S., M.D. Edin., F.F.A. R.C.S., D.A.: part-time anæsthetist (consultant), Rush Green Hospital.

HOLLAND, H. W., M.B. Lond., M.R.C.P., D.M.R.: part-time radiologist (consultant) Chelmsford group of hospitals.

NELSON-JONES, ARCHIBALD, M.D. Lond., M.R.C.P.; part-time physician (consultant), Rush Green Hospital.

SUTTON, F. R., M.B. Lond., F.R.C.S.: part-time surgeon (consultant), Rush Green Hospital.

Births, Marriages, and Deaths

BIRTHS

LEWES.—On Dec. 29, at Bedford General Hospital, to Daphne (née Wailes), wife of David Lewes, D.M., M.R.C.P.—a fourth daughter (Christina).

DEATHS

RENTZSCH.—On Dec. 27, at St. Lawrence's Hospital, Bodmin, Sigismund Henry Rentzsch, M.R.C.S., in his 88th year, father of Maude Mary Langham, 35, Cranley Gardens, London, S.W.7.

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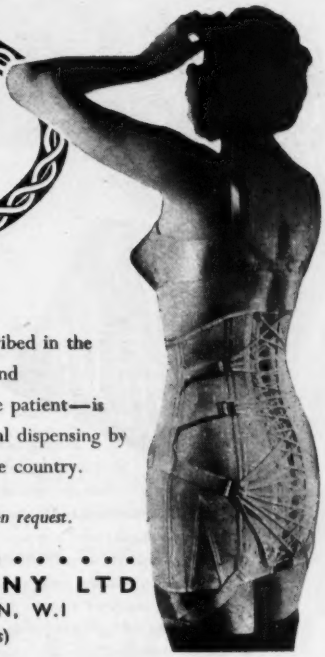

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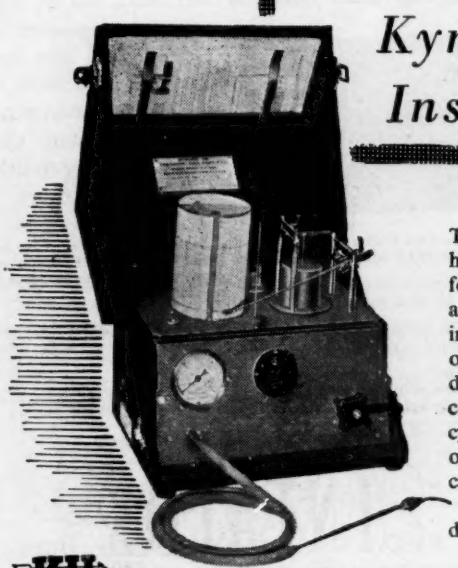

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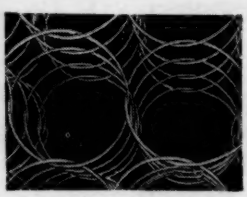

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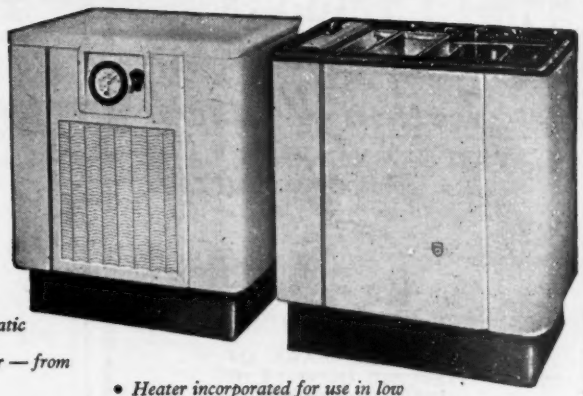

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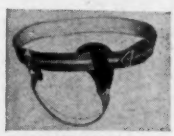

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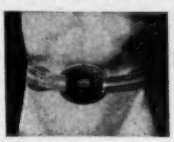

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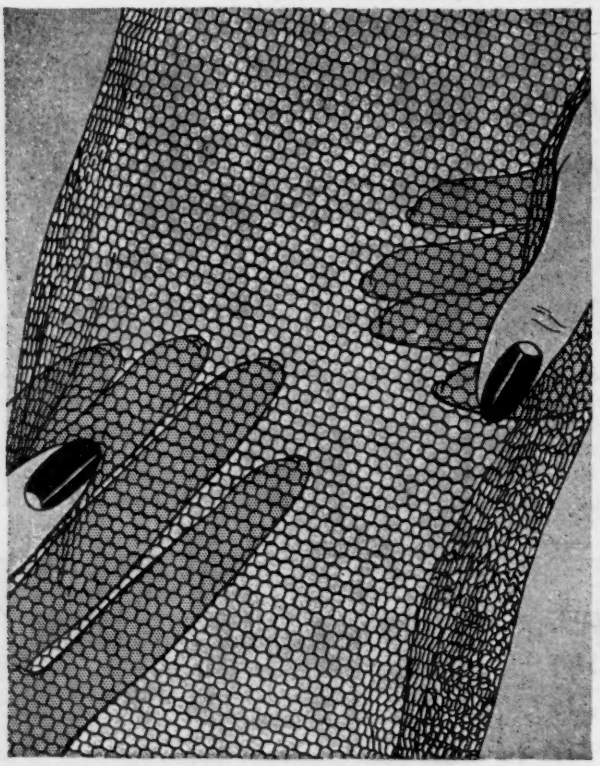

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Academic and Educational

ROYAL COLLEGE OF SURGEONS OF ENGLAND

COURT OF EXAMINERS

Notice is hereby given that the Council on 11TH MARCH, 1954, will elect 2 Members of the Court of Examiners. The Examiners retiring in rotation are Mr. A. Wallis Kendall, V.R.D., and Mr. Eric L. Farquharson, who are applying for re-election.

Fellows of the College desirous of becoming candidates for the Office must make application, in writing, to the Secretary on or before 2nd February, 1954.

KENNEDY CASSELS, Secretary.

Lincoln's Inn-fields, London, W.C.2.

UNIVERSITY OF LONDON

A LECTURE on "Medical Treatment of Hyperthyroidism and Thyroiditis" will be given by Dr. GEORGE CRILE (Cleveland Clinic, Ohio) at 5.30 P.M. on 19TH JANUARY at Westminster Medical School (Meyerstein Theatre), Horseferry-road, S.W.1.

Admission free, without ticket.

JAMES HENDERSON, Academic Registrar.

UNIVERSITY OF LONDON

A LECTURE entitled "Present Views on Embryonal Induction" will be given by Prof. J. PASTEELS (Brussels) at 5 P.M. on 14TH JANUARY at Middlesex Hospital Medical School, Mortimer-street, W.1.

Admission free, without ticket.

JAMES HENDERSON, Academic Registrar.

BRITISH POSTGRADUATE MEDICAL FEDERATION UNIVERSITY OF LONDON

"THE SCIENTIFIC BASIS OF MEDICINE"
1953–1954

SECOND TERM: JANUARY–MARCH, 1954

The following lectures, which are designed especially for research workers and specialists in training, will be delivered at The London School of Hygiene and Tropical Medicine, Keppel-street, W.C.1, on TUESDAY and THURSDAY afternoons at 5.30 P.M. during the second term of the session 1953–54. Admission free, without ticket.

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Thurs. 14th	Dr. E. ARNOLD CARMICHAEL, C.B.E., F.R.C.P. (Institute of Neurology)	Hemispherectomy and Localisation of Function
Tues. 19th	Prof. G. R. CAMERON, F.R.C.P., F.R.S. (University College Hospital Medical School)	Tissue Repair
Thurs. 21st	Dr. D. D. REID, M.D., PH.D. (London School of Hygiene and Tropical Medicine)	The Design of Clinical Experiments
Tues. 26th	Prof. J. B. S. HALDANE, M.A., F.R.S. (University College London)	The Genetics of some Biochemical Abnormalities
Thurs. 28th	Prof. E. BOYLAND, PH.D., D.SC. (Institute of Cancer Research)	Chemotherapy of Cancer
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Tues. 2nd	Prof. L. P. GARROD, M.D., F.R.C.P. (St. Bartholomew's Hospital)	Causes of Failure in Antibiotic Therapy
Thurs. 4th	Prof. A. A. MILES, C.B.E., M.D., F.R.C.P. (Lister Institute)	Reactions to Bacterial Invasion
Tues. 9th	Prof. Lord STAMP, M.A., M.B., CH.B. (Postgraduate Medical School of London)	The Action of Bacterial Enzymes on Immunising Antigens
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Tues. 16th	Dr. C. C. CHESTERMAN, O.B.E., M.D., F.R.C.P. (Middlesex Hospital Medical School)	Anti-malarial Drugs—Their Action in Different Stages of the Malaria Parasite in Man
Thurs. 18th	Dr. P. M. D'ARCY HART, M.A., M.D., F.R.C.P. (Medical Research Council)	Chemotherapy of Tuberculosis
Tues. 23rd	Dr. R. R. RACE, PH.D., M.R.C.S., F.R.S. (Lister Institute)	Blood Groups
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L.M.S.S.A.

FINAL EXAMINATION: SURGERY, 8th February, 8th March, 12th April, 1954. MEDICINE, PATHOLOGY, 15th February, 15th March, 19th April, 1954. MIDWIFERY, 16th February, 16th March, 20th April, 1954. MASTERY OF MIDWIFERY, May and November. DIPLOMA IN INDUSTRIAL HEALTH, July and December.

For regulations apply REGISTRAR, Apothecaries' Hall, Black Friars-lane, London, E.C.4.

UNIVERSITY OF GLASGOW

I.C.I. RESEARCH FELLOWSHIPS

Applications are invited for I.C.I. Research Fellowships in Biochemistry, Chemistry, Engineering, Pharmacology, or Physics, to which some appointments may be made during the current academic year. The appointments will date from 1st October, 1954. The salary will depend upon qualifications and experience, but will be within the range £600–£900 p.a., together with F.S.S.U. benefits and family allowances.

Applications (8 copies), with a list of publications and names of 2 referees, should be sent not later than 27th February, 1954, to the undersigned, from whom further particulars may be obtained.

ROBT. T. HUTCHESON, Secretary of University Court.

THE UNIVERSITY OF MANCHESTER

FACULTY OF MEDICINE

DIPLOMA IN DIAGNOSTIC RADIOLOGY (R.C.P. AND S. ENG.)

A course of instruction for the above Diploma will commence on 1ST MARCH, 1954, and extend over a period of 2 years. The course is full-time, non-resident: inclusive fee £52. Applications are invited from registered medical practitioners who fulfil the requirements as to previous medical experience laid down by the Examining Board in England (D.M.R.D. Regulations obtainable from the London Conjoint Board, 8–11, Queen-square, London, W.C.1). A limited number of posts will be available at a salary of £670 p.a., which may be held while taking the course. These posts are at present being advertised by the Board of Governors of the United Manchester Hospitals and applications should be made as directed in the advertisement.

Application to take the course should be made to the Dean of Postgraduate Medical Studies, The University of Manchester, not later than 18th January, 1954.

SIR ALFRED FRIPP MEMORIAL FELLOWSHIP

Applications are invited for the Sir Alfred Fripp Memorial Fellowship in Child Psychology tenable at Guy's Hospital. The Fellowship is open to medically qualified men or women under the age of 35, preferably with experience in pædiatrics as well as in psychological medicine. Stipend £250 p.a. The appointment is for 2 years and may be held concurrently with a part-time appointment at Guy's or elsewhere.

Applications should be forwarded to the Dean, Guy's Hospital Medical School, S.E.1 (from whom copies of the regulations may be obtained), together with the names of 3 referees, not later than 31st January, 1954. Candidates should submit with their applications particulars of their previous career and a definite scheme of advanced study or research to be carried out during the tenure of the Fellowship.

THE NUFFIELD FOUNDATION

FELLOWSHIPS AND SCHOLARSHIPS IN DENTISTRY

The Nuffield Foundation invites applications, from citizens of the United Kingdom, for Fellowships and Scholarships in Dentistry. To help the advancement of teaching and research on dental health and disease, the Foundation is prepared to award a number of Fellowships:—

(i) to enable selected men and women with dental qualifications to receive such additional training in pure and applied science as is desirable to fit them for an academic career in dentistry (but not to obtain a medical qualification); and

(ii) to enable selected university graduates in medicine and science to receive training that will qualify them to undertake teaching and fundamental research on dental health and disease.

The Foundation is also prepared to award a limited number of Scholarships to assist students of outstanding ability attending a University Dental School to devote 1 or 2 years to further studies of the basic sciences.

Applications for Fellowships should be received by 1st March annually and for scholarships by 30th June annually. Copies of the conditions of both Fellowships and Scholarships and the application forms are obtainable from the Director, The Nuffield Foundation, Nuffield Lodge, Regent's Park, London, N.W.1.

L. FARRER-BROWN, Director of the Nuffield Foundation.

COURSE IN DISORDERS OF THE SPINE

at the

INSTITUTE OF ORTHOPÆDICS

25TH–30TH JANUARY, 1954

25th January Town Section	Lumbar disc injuries	Mr. P. H. NEWMAN
	Cervical disc injuries	Dr. P. H. SANDIFER
	Fractures of the spine	Mr. D. TREVOR
26th January Stoke Mandeville Hospital, Aylesbury	Traumatic paraplegia	Dr. L. GUTTMAN
27th January Town Section	Injuries of the cervical spine	Mr. H. J. BURROWS
	Spina bifida	Mr. T. L. CARR
	X-rays of spinal conditions including tumours	Dr. F. C. GOLDING
	Kyphosis	Mr. A. T. FRIPP
28th January Country Section	Infections of the spine other than tuberculosis	Mr. H. J. SEDDON
	Spondylolisthesis	Mr. P. H. NEWMAN
	Tuberculosis of the spine	Mr. J. A. CHOLMELEY
29th January Country Section	Scoliosis	Mr. J. I. P. JAMES
	Pott's paraplegia	Mr. H. J. SEDDON
30th January Country Section	General clinical demonstration	Mr. K. I. NISSEN

The fee for the course (including lunch and tea) is 7 guineas.

Early application should be made to the Dean, at 234, Great Portland-street, W.1.

INSTITUTE OF BASIC MEDICAL SCIENCES
ROYAL COLLEGE OF SURGEONS OF ENGLAND
BRITISH POSTGRADUATE MEDICAL FEDERATION

LECTURES AND DEMONSTRATIONS IN ANATOMY, APPLIED PHYSIOLOGY AND PATHOLOGY, OCTOBER, 1954–JANUARY, 1955

A full-time Course of Lectures and Demonstrations in the above subjects will be held at the Institute from 4th October, 1954, to 1st January, 1955. Applications for this Course will be strictly limited. Fee—£63.

Closing date for applications is Friday, 2nd April, 1954.

LECTURES IN ANATOMY, APPLIED PHYSIOLOGY AND PATHOLOGY OCTOBER, 1954–JANUARY, 1955

A course of Lectures only in the above subjects will be held at the Institute from 4th October, 1954, to 1st January, 1955. The Lectures will be held in the mornings from MONDAY to FRIDAY each week. Fee—£36 15s.

Full information of and application forms for these courses may be obtained from Mr. W. F. DAVIS, Secretary, Institute of Basic Medical Sciences, Royal College of Surgeons of England, Lincoln's Inn-fields, London, W.C.2 (HOLborn 3474).

THE LONDON HOSPITAL MEDICAL COLLEGE

COURSES IN ADVANCED SURGERY

An evening Postgraduate Course in Surgery for the Final Examination of the F.R.C.S., will be held at The London Hospital from 15TH MARCH to 26TH APRIL, 1954. The Course will be held on MONDAY and WEDNESDAY evenings from 6.30 P.M. to 8.30 P.M. with the exception of Monday, 19th April, and will be limited to 18 students.

Applications should be made to the Dean, from whom further particulars can be obtained. The fee for External candidates will be 16 guineas and for "Old Londoners" 10 guineas.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL. (UNIVERSITY OF LONDON.) DEPARTMENT OF CHEMICAL PATHOLOGY. Applications are invited for the post of JUNIOR LECTURER AND RESEARCH ASSISTANT (non-medical). Candidates should hold a Ph.D. degree or its equivalent in chemistry or biochemistry. Duties mainly research, but some teaching will be possible. Salary scale £600–£50–£750 with superannuation and family allowance.

Applications, with the names and addresses of 3 referees, should be submitted before 15th February, 1954, to the Secretary, King's College Hospital Medical School, Denmark Hill, London, S.E.5, from whom further particulars may be obtained.

LISTER INSTITUTE OF PREVENTIVE MEDICINE, ELSTREE, HERTS. ASSISTANT BACTERIOLOGIST (Male) required for Vaccine Lymph Department. Facilities for research. Salary range £700–£1000 depending on qualifications and experience.

Application by letter, stating age, qualifications, experience, and with names of 2 referees, to Bacteriologist-in-charge.

UNIVERSITY OF LONDON. Applications are invited from graduates of the University of London for the HAZEL CLIFFORD STUDENTSHIP (value not less than £550 p.a. for 1 year, renewable for a second year) for postgraduate research in medicine or on a scientific topic concerned with the advancement of medical knowledge.

Forms and further particulars from the Secretary to the Scholarships Committee, Senate House, London, W.C.1, to whom completed applications must be returned by 15th February, 1954.

THE UNIVERSITY OF SHEFFIELD. Applications are invited for a newly instituted Full-time CHAIR OF SURGERY. The Professor will be granted an honorary contract (in the rank of Consultant) by the Board of Governors of the United Sheffield Hospitals and will take charge of an existing Clinical Unit in the Royal Infirmary, Sheffield, where a building, shortly to be undertaken by the University, will provide new laboratory and teaching facilities. The possibility also exists of development of a professorial unit under the Sheffield Regional Hospital Board.

Further particulars should be obtained from the Registrar, The University, Sheffield, 10, and applications for the Chair should reach him not later than 27th February, 1954.

Hospital Services : Senior Appointments

HOSPITALS FOR DISEASES OF THE CHEST. The Board of Governors invites applications for the appointment of CONSULTANT RADIOLOGIST (diagnostic) tenable at London Chest Hospital. Applicants must hold a Diploma in Diagnostic Radiology. The duties are assessed in total as 3 notional half-days involving attendances for 2 notional half-days each week (Tuesdays and Thursdays) at the Hospital, Victoria Park, E.2, and 1 notional half-day in alternate weeks at the Hospital's Country Unit at Ariesey, near Letchworth.

Applications (12 copies), stating date of birth, qualifications, and experience, with the names of 3 referees, should reach the undersigned not later than 27th January, 1954.

KENNETH A. F. MILES, Secretary to the Board.
Brompton Hospital, S.W.3.

CHARING CROSS HOSPITAL, W.C.2. Applications are invited for the office of ASSISTANT OBSTETRICIAN AND GYNÆCOLOGIST of Consultant status to Charing Cross Hospital. The candidate must hold a University degree in Medicine and must be a Fellow or Member of the Royal College of Obstetricians and Gynæcologists. He must also be a Fellow of the Royal College of Surgeons of England or a Member of the Royal College of Physicians of London. The appointed candidate will be required to undertake duties in the parent Hospital, in the Obstetric Unit at Kingsbury Maternity Hospital (including undergraduate teaching), and in other hospitals of the Group. The appointment is part-time and about 6 sessions are envisaged.

Further particulars may be obtained from the Secretary to the Board. Candidates should submit 50 copies of their applications by 30th January, 1954.

FRANK HART, Secretary to the Board.

CHARING CROSS HOSPITAL, W.C.2. Assistant PhysiCIAN. The post is part-time and of Consultant status.

Candidates, who must be Members of the Royal College of Physicians of London, should submit 50 copies of their applications, stating date of birth, qualifications and experience, and the names of 3 referees, to reach the undersigned by 29th January, 1954. FRANK HART, Secretary to the Board.

GUY'S HOSPITAL, S.E.1. The Board of Governors invite applications for the appointment of ASSISTANT DENTAL SURGEON to Guy's Hospital with attendance on 3 half-days a week. The appointment is of Consultant status and applicants should hold a medical or higher dental qualification.

Applications (1 copy), together with the names of 3 referees, should be submitted to reach the Superintendent, Guy's Hospital, S.E.1, not later than 31st January, 1954. In accordance with Statutory Instrument No. 1259 of the National Health Service Regulations, canvassing members of the Board or Advisory Appointments Committee will lead to disqualification.

HOSPITAL OF ST. JOHN AND ST. ELIZABETH, 60, Grove End-road, London, N.W.8. Applications are invited for the post of HONORARY ORTHOPÆDIC SURGEON. Candidates must be Fellows of 1 of the Royal Colleges of Surgeons or M.S. of a recognised University.

Applications (25 copies) should be sent to the undersigned on or before Saturday, 27th February, 1954. Testimonials are not required but the names of 3 persons willing to act as referees should be furnished. Sister MARY CLARE, Secretary.

NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for appointment as :—

(1) Part-time DERMATOLOGIST (Consultant grade) at Mile End Hospital (1 session a fortnight), St. George-in-the-East Hospital (1 session a fortnight), St. Andrew's Hospital, Bow (1 session a week). Joint appointment.

(2) Part-time CONSULTANT E.N.T. SURGEON, St. Margaret's Hospital, Epping (2 sessions a week) and Honey Lane Hospital (as required).

(3) Part-time CONSULTANT PSYCHIATRIST (6 sessions a week) for duties at Oldchurch Hospital, Romford, Essex (mainly in connection with the recently established Barbiturate Unit), and St. George's Hospital, Hornchurch, Essex (to take charge of Neurosis Unit and to undertake psychiatric work in geriatric wards).

Residence in area is a condition of appointment. Further details on application.

Applications (6 copies), indicating post concerned and detailing private address, date of birth, qualifications and experience, present appointment(s) (including number of sessions) and grade, and names of 3 referees, should reach the Secretary, 11A, Portland-place, London, W.1, by Saturday, 23rd January, 1954.

ROYAL CANCER HOSPITAL, Fulham-road, London, S.W.3. Applications are invited for the post of Full-time ASSISTANT PATHOLOGIST (Senior Hospital Medical Officer grade) in the Department of Pathology. Duties will be in all branches of pathology. Resident quarters are available.

Applications (25 copies), together with names of 3 referees, should be sent to the House Governor to reach him not later than 25th January, 1954.

ROYAL FREE HOSPITAL. Applications are invited from registered medical practitioners (Women) for the post of ASSISTANT to the V.D. Department. 6 sessions per week. Duties to commence 1st April, 1954. Salary and conditions of service in accordance with those laid down by the Ministry of Health for Senior Hospital Medical Officers.

Applications, giving details of experience and the names of 3 referees, should be sent not later than 23rd January, 1954, to the Secretary to the Board of Governors, Royal Free Hospital, Gray's Inn-road, W.C.1.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires Whole-time ASSISTANT PATHOLOGIST (Senior Hospital Medical Officer grade) for Group Laboratory at Lambeth Hospital, S.E.11. Candidates must have experience in all branches of clinical pathology with special interest in hæmatology and morbid anatomy.

Applications (5 copies), giving date of birth, qualifications, experience, names of 3 referees, to Secretary (S.1) South West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, by 30th January, 1954. Applicants may visit Laboratory by local arrangement.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires Part-time CONSULTANT PHYSICIAN (Female) (2 half-days per week) at the South London Hospital for Women, S.W.4. Candidates should have neurological experience.

Applications (5 copies), giving date of birth, qualifications, experience, and names of 3 referees, to Secretary (S.1), South West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, by 6th February, 1954. Applicants may visit Hospital by local arrangement.

BRISTOL CLINICAL AREA. South-western Regional HOSPITAL BOARD. Applications are invited from registered medical practitioners for the appointment of CONSULTANT ANÆSTHETIST in the Bristol Clinical Area. The appointment will be held on a maximal part-time basis (9 sessions). The successful candidate will be required to work mainly at Weston-super-Mare General Hospital (approximately 7 sessions), and to visit other hospitals in the Clinical Area as may be determined by the Regional Board from time to time. He will be expected to live in Weston-super-Mare.

Applications (12 copies), stating date of birth, qualifications and experience together with 12 copies of 2 testimonials, and the names and addresses of 2 referees should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 30th January, 1954.

BRISTOL. HORTHAM-BRENTRY HOSPITAL GROUP. SOUTH-WESTERN REGIONAL HOSPITAL BOARD. Applications are invited from registered medical practitioners for the appointment of DEPUTY MEDICAL SUPERINTENDENT to the Hortham-Brentry Hospital Group, Bristol (1359 Beds). The Deputy Medical Superintendent will be mainly concerned in assisting in the clinical and administrative work of Hortham Hospital (740 Beds). The appointment will be on a whole-time basis in the Senior Hospital Medical Officer grade, and previous experience in mental deficiency is essential. The successful candidate, who will work under the general direction of the Medical Superintendent, will also be required to visit some of the ancillaries. A small furnished flat is available.

Applications (12 copies) stating date of birth, qualifications and experience, together with 12 copies of 2 testimonials and the names and addresses of 2 referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 16th January, 1954.

BIRMINGHAM REGIONAL HOSPITAL BOARD.

(*a*) **Birmingham (Selly Oak) Group of hospitals**

Whole-time CONSULTANT in Anæsthetics. Duties mainly at Selly Oak Hospital. Experience specialty and D.A. required.

(*b*) **Wolverhampton Group of hospitals**

Whole-time ASSISTANT PATHOLOGIST of Consultant status. Duties at Royal Hospital, Wolverhampton and other Group hospitals. Wide experience specialty required and special experience in hæmatology an advantage.

Applications (15 copies), stating name, age, nationality, qualifications, present and previous appointments, and details of 3 referees, to Secretary, 10, Augustus-road, Birmingham, 15, before 25th January, 1954. Candidates may visit Group hospitals.

ARLESEY, BEDS. THREE COUNTIES HOSPITAL (MENTAL). Locum Tenens SENIOR HOSPITAL MEDICAL OFFICER (resident or non-resident) required immediately.

Applications, with full particulars of previous experience and testimonials, to the Medical Superintendent.

EAST ANGLIAN REGIONAL HOSPITAL BOARD. SENIOR MEDICAL OFFICER (whole-time), non-resident, St. Leonard's and Walnuttree Hospitals, Sudbury-West Suffolk Group. The duties include those of Medical Officer in charge at Walnuttree Hospital and involve the treatment and rehabilitation of long-term or aged sick (170 Beds); the supervision of a Tuberculosis Unit of 12 Beds under Consultant Chest Physician; some casualty work at St. Leonard's Hospital and medical administrative work at both hospitals. Salary scale £1300–£1750.

Applications (8 copies), stating age, qualifications, and details of present and previous appointments, together with names of 3 referees, to Secretary of Board, 117, Chesterton-road, Cambridge, by 18th January, 1954.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for 2 non-resident whole-time posts of ASSISTANT ANÆSTHETIST as follows:—

(*a*) Bury and Rossendale Hospitals (Bury General Hospital, Fairfield General Hospital, Rossendale General Hospital, &c.).

(*b*) Ashton, Hyde and Glossop Hospitals (Ashton-under-Lyne General Hospital, &c.).

Successful candidates to work under general guidance of a Consultant. Salary £1300–£50–£1750 p.a. Candidates for both posts should state preference.

Application forms from the Senior Administrative Medical Officer to the Board at Cheetwood-road, Manchester, 8, to be returned by 28th January, 1954.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the whole-time post of DEPUTY SUPERINTENDENT AND RESIDENT MEDICAL OFFICER to Wrightington Hospital, near Wigan (350 Beds for tuberculosis, mainly non-pulmonary). Salary £1300–£50–£1750 p.a. Single accommodation only available; otherwise post non-resident, successful candidate, if non-resident, to sleep in when on duty. Further inquiries from the Medical Superintendent.

Application forms from the Senior Administrative Medical Officer to the Board at Cheetwood-road, Manchester, 8, to be returned by 25th January, 1954.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the part-time (8 half-days) post of CONSULTANT PHYSICIAN to Withington (756 Beds) and Wythenshawe (300 Beds) Hospitals, Manchester. The majority of the sessions will be at Withington Hospital. Higher qualifications essential and appointee required to live within reasonable distance of main hospital.

Application forms from the Senior Administrative Medical Officer at Cheetwood-road, Manchester, 8, to be returned by 21st January, 1954.

AMENDED ADVERTISEMENT

NEWCASTLE REGIONAL HOSPITAL BOARD. WINTERTON HOSPITAL, SEDGEFIELD. (2000 Beds.) CONSULTANT PSYCHIATRIST, whole-time, or part-time for 9 sessions per week. Resident. Applicant must have had wide experience in psychiatry and be competent to take clinical responsibility for a section of the Hospital and to participate in the work of the associated outpatient clinics and domiciliary Consultant Service in the area served by the Hospital, subject to general administrative control of the Medical Superintendent. He must be prepared to visit the associated general hospitals as required, and undertake the treatment of suitable cases in the general wards. Salary scale £1700–£2750 p.a. whole-time, pro rata part-time. If not resident the Psychiatrist appointed must live near the Hospital. A house is available in the Hospital grounds. Appointment subject to National Health Service (Superannuation) Regulations, 1950. Candidates are free to visit the Hospital by arrangement with the Medical Superintendent, from whom particulars may be obtained.

Applications, together with names and addresses of referees (preferably), or testimonials, to a total of 3, to be sent to the Regional Psychiatrist, "Blythswood South," Osborne-road, Newcastle upon Tyne, 2, within 28 days.

AMENDED ADVERTISEMENT

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. FIRST ASSISTANT (Senior Hospital Medical Officer grade) required (whole-time) to the Accident Service at Hitchin, Herts. Salary scale £1300 (at age 32)–£1750. Duties will also include medical administration of the Hitchin Hospitals (387 Beds). Appointments normally made from candidates over 32 years but applicants under that age considered. Hospitals may be visited by direct appointment with Medical Administrator, Lister Hospital.

Detailed applications, including date of birth, and names of 3 referees, to Secretary, North West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, by 6th February, 1954.

PLYMOUTH CLINICAL AREA. South-western Regional HOSPITAL BOARD. Applications are invited from registered dental practitioners for the appointment of CONSULTANT DENTAL SURGEON in the Plymouth Clinical Area. The appointment will be on a part-time (4 sessions) basis, and wide experience in dental surgery is essential. The successful candidate will have charge of beds at the South Devon and East Cornwall Hospital, Plymouth, and may be required to visit other hospitals in the Clinical Area as may be determined by the Regional Board from time to time.

Applications (12 copies), stating date of birth, qualifications and experience together with 12 copies of 2 testimonials, and the names and addresses of 2 referees should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 30th January, 1954.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time CONSULTANT ANÆSTHETIST required for the City General Hospital, Sheffield (682 Beds), and the Barnsley Hospitals (Beckett Hospital, 182 Beds; St. Helen Hospital, 220 Beds). The City General Hospital has teaching affiliations with the University of Sheffield. There are Professorial Medical and Gynæcological Units, and a Department of Thoracic Surgery, and a Regional Cardiological Centre.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 30th January, 1954.

SHEFFIELD REGIONAL HOSPITAL BOARD. Locum SENIOR CASUALTY OFFICER required immediately at the Beckett Hospital, Barnsley, for 6 weeks in the first instance. Remuneration at the rate of 31½ guineas per week.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood road, Sheffield, giving age, nationality, qualifications, present and previous appointments with dates, naming 2 referees.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time ASSISTANT ANÆSTHETIST required for hospitals in the Mansfield area, approximately 2 of the sessions being spent at hospitals in the Nottingham area. Candidates should be in possession of the D.A. Salary scale £1300–£50–£1750 p.a.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Completed forms to be returned by 6th February, 1954.

SHEFFIELD REGIONAL HOSPITAL BOARD. Appointment as Whole-time CONSULTANT PSYCHIATRIST at Carlton Hayes Hospital, Narborough, Leics., vacant 18th May, 1954. House available. Applicants and existing consultants may apply for post as Medical Superintendent, which will be vacant.

Application form and further details obtainable from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 6th February, 1954. Applicants should state whether they wish to be considered for the post of Medical Superintendent.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time SENIOR ASSISTANT PSYCHIATRIST required for the Lawn Hospital, Lincoln. A flatlet is available. Salary £1300–£50–£1750.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 6th February, 1954.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time Resident Locum SENIOR CASUALTY OFFICER required immediately at the Royal Infirmary, Doncaster, for a minimum period of 2 months. Remuneration at the rate of 31½ guineas per week with a deduction for residence.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, giving age, nationality, qualifications, present and previous appointments with dates, and naming 2 referees.

SCOTLAND. NORTHERN REGIONAL HOSPITAL BOARD. Applications are invited for the post of Part-time CONSULTANT in Ophthalmology (9 notional half-days).

Schedules of application, which should be lodged by 13th February, 1954, are obtainable from the undersigned, who will also supply further particulars.

A. M. FRASER, M.D.,
Secretary and Administrative Medical Officer.
Office of the Northern Regional Hospital Board,
Raigmore, Inverness.

SCOTLAND. NORTHERN REGIONAL HOSPITAL BOARD. Applications are invited for the post of MEDICAL SUPERINTENDENT of the Inverness Group of hospitals. The salary scale is £1550–£75(2)–£1700–£100–£1800. A house is available at the Royal Northern Infirmary, Inverness.

Schedules of application and further particulars of the post are obtainable from the undersigned, with whom applications should be lodged by 13th February, 1954.

A. M. FRASER, M.D.,
Secretary and Administrative Medical Officer.
Office of the Northern Regional Hospital Board,
Raigmore, Inverness.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the following appointments :—

Part-time CONSULTANT OBSTETRICIAN AND GYNÆCOLOGIST in charge of wards at Stobhill Hospital, Glasgow. The number of weekly sessions is 7.

Part-time CONSULTANT PÆDIATRICIAN based at the Royal Hospital for Sick Children, Glasgow, and with duties elsewhere in the Region as may be arranged. The number of weekly sessions is 8.

These appointments are subject to the National Health Service (Scotland) superannuation regulations.

Applications (16 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, not later than 30 days after the publication of this advertisement.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires CONSULTANT ANÆSTHETIST (whole-time or 9 half-days per week), for Portsmouth Group of hospitals and Western Area Thoracic Surgical Unit. Wide experience in anæsthetics for thoracic surgery and possession of D.A. required. Thoracic work (approximately 5 half-days per week) between Thoracic Unit at Southampton, St. Mary's Hospital, Portsmouth, and Royal National Hospital, Ventnor, Isle of Wight ; remainder in general surgery in Portsmouth Group.

Applications (5 copies), giving date of birth, qualifications, experience, names of 3 referees, to Secretary (S.1), South West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, by 6th February, 1954. Applicants may visit hospitals by local arrangement.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires Whole-time CONSULTANT PSYCHIATRIST at Cane Hill Hospital, Coulsdon, Surrey, which serves a large area in South London, where it has its own outpatient clinics and undertakes postgraduate teaching in connection with the Institute of Psychiatry. Candidates should possess the D.P.M. and a higher medical qualification.

Applications (5 copies), giving date of birth, qualifications, experience, and names of 3 referees, to Secretary (S.1), South West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, by 6th February, 1954. Applicants may visit the Hospital by local arrangement.

WELSH REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of an ASSISTANT ANÆSTHETIST (Senior Hospital Medical Officer scale) to serve the Mid-Glamorgan Hospital Management Committee. The successful candidate will be based at Neath General Hospital and will also be expected to serve other hospitals within the Group. Possession of the D.A. will be an advantage. The successful candidate will work under the Consultant-in-charge.

Applications (12 copies), stating age, giving a summary of qualifications, experience, previous appointments with dates, and publications, together with the names of 3 referees, should be addressed to the Senior Administrative Medical Officer, Welsh Regional Hospital Board, Cathays Park, Cardiff, within 21 days of appearance of this advertisement.

Hospital Services : Junior Appointments

BETHNAL GREEN HOSPITAL, Cambridge Heath-road, London, E.2. Applications are invited from registered or provisionally registered medical practitioners for the post of HOUSE PHYSICIAN (pre-registration). Tenure 6 months. Salary £350 or £400 p.a., depending on experience, less £100 p.a. residential charges.

Applications, stating age, nationality, qualifications and experience, with copies of 3 recent testimonials, to the Hospital Secretary.

BROMPTON HOSPITAL, S.W.3. Applications are invited for the post of ANÆSTHETIC REGISTRAR (full-time). The appointment is for 1 year with eligibility for reappointment.

Applications, stating age, qualifications with dates, nationality and appointments held, together with copies of testimonials, by 14th January 1954, to—

KENNETH A. F. MILES, House Governor.

BROOK GENERAL HOSPITAL, Shooters Hill-road, Woolwich, S.E.18. HOUSE PHYSICIAN (infectious diseases), vacant 17th February. Appointment for 6 months in first instance. Salary £450 p.a., less £100 p.a. for residence.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

CONNAUGHT HOSPITAL, Walthamstow, E.17. (118 Beds.) Applications are invited for the post of RESIDENT ANÆSTHETIST graded as Senior House Officer, vacant 26th January, 1954. Salary £670 p.a., less £120 p.a. for board, lodging, &c. Recognised for D.A. and F.F.A. R.C.S.

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials should be sent immediately to the Secretary, Hospital Management Committee, Forest Group, Langthorne-road, E.11.

CENTRAL MIDDLESEX HOSPITAL, Park Royal, N.W.10. RESIDENT HOUSE OFFICER in Orthopædic Department. Pre-registration applicants will be considered. Appointment for 6 months from 16th February, 1954.

Applications, with copies of 2 testimonials, to Medical Director by 16th January, 1954.

CENTRAL MIDDLESEX HOSPITAL, Park Royal, N.W.10. RESIDENT SENIOR HOUSE OFFICER required for Casualty Department. Successful candidate will work under supervision of Orthopædic and Traumatic Specialist. Preference given to applicant who has held resident surgical and medical posts in general hospitals. Post vacant 1st March, 1954. Appointment for 6 months subject to renewal for further 6 months.

Applications, with names of 2 referees or copies of 2 testimonials, to Medical Director by 23rd January, 1954.

CENTRAL MIDDLESEX HOSPITAL, Park Royal, N.W.10. RESIDENT HOUSE OFFICER in Obstetric and Gynecological Department. Appointment for 6 months from 23rd February, 1954.

Applications, with copies of 2 testimonials, to Medical Director by 16th January, 1954.

DULWICH HOSPITAL, East Dulwich-grove, London, S.E.22. CAMBERWELL HOSPITALS MANAGEMENT COMMITTEE. Applications invited for appointment as SENIOR HOUSE OFFICER (casualty duties). Position vacant from 1st February. Salary £670 a year ; non-resident post, day-time duties.

Applications, stating age, qualifications and experience, enclosing copy testimonials, to the Secretary, Camberwell Hospitals Management Committee, Dulwich Hospital, S.E.22, as soon as possible.

ELIZABETH GARRETT ANDERSON HOSPITAL, Euston-road, N.W.1. (ROYAL FREE HOSPITAL GROUP.) Applications are invited from pre-registration and registered Women medical practitioners for the post of OBSTETRIC HOUSE SURGEON (recognised for the M.R.C.O.G.). Duties to commence 1st March, 1954. Appointment for 6 months. Salary in accordance with Ministry of Health scale for House Officers.

Applications, with copies of 3 recent testimonials, to be sent to the Secretary, Elizabeth Garrett Anderson Hospital, by 19th January, 1954.

EAST HAM MEMORIAL HOSPITAL, Shrewsbury-road, London, E.7. Applications are invited for the post of CASUALTY OFFICER AND ORTHOPÆDIC HOUSE SURGEON combined with the post of Deputy Resident Surgical Officer (Senior House Officer), Male or Female, at the above Hospital for 6 months commencing 15th February, 1954. (Post recognised for F.R.C.S.)

Applications, together with copies of recent testimonials, to the Group Secretary, West Ham Group Hospital Management Committee, Stratford, London, E.15, by 23rd January, 1954.

GERMAN HOSPITAL, Dalston, E.8. (General—157 Beds.) Applications for the 6 months appointment of HOUSE PHYSICIAN at the above Hospital (now vacant) should be sent immediately to the Group Secretary, Hackney Hospital, London, E.9. with copy testimonials, quoting reference GH/HP.

HACKNEY HOSPITAL, London, E.9. (General—307 Beds.) Applications for the 6 months appointment of CASUALTY OFFICER AND F.N.T. HOUSE SURGEON (House Officer grade), vacant in February, should reach the Group Secretary, Hackney Hospital, E.9, as soon as possible, quoting reference HH/CO.

HIGHLANDS HOSPITAL, Winchmore Hill, N.21. House PHYSICIAN, vacant 18th January, 1954. Preference given to applicants seeking pre-registration posts under Medical Act, 1950.

Applications, with copies of 3 testimonials, to Hospital Secretary.

HIGHLANDS HOSPITAL, Winchmore Hill, N.21. RESIDENT ANÆSTHETIST with casualty and general duties (House Officer) required.

Applications, with copies of 3 testimonials, to Hospital Secretary.

LAMBETH HOSPITAL, Brook-drive, S.E.11. Applications are invited from pre-registration and registered medical practitioners for the positions (2) of RESIDENT HOUSE SURGEON. The appointments are for 6 months, commencing on 11th February, 1954, and are recognised for the F.R.C.S.

Application forms from the Physician-Superintendent.

LONDON HOSPITAL, Whitechapel, E.1, invites applications for the post of SENIOR REGISTRAR in General Surgery becoming vacant on 11th March, 1954. Candidates should be Fellows of one of the Royal Colleges of Surgeons.

Applications (12 copies), giving the names and addresses of 3 referees, should reach the House Governor by 31st January, 1954.

H. BRIERLEY, House Governor.

LONDON HOSPITAL, Whitechapel, E.1, invites applications for the post of SENIOR HOUSE OFFICER to the Receiving Room becoming vacant on 9th March, 1954. In view of the nature of the duties preference will be given to applicants who have held a previous appointment at the Hospital.

Applications (6 copies), giving full particulars, together with 6 copies of 3 recent testimonials, should reach the House Governor by 31st January, 1954. H. BRIERLEY, House Governor.

LONDON JEWISH HOSPITAL, Stepney Green, London, E.1. Applications are invited for the post of RESIDENT HOUSE PHYSICIAN, vacant 9th February, 1954. Tenable for 6 months, renewable. (Available as pre-registration appointment.) Salary £350, £400, or £450 p.a., according to experience, subject to deduction at the rate of £100 p.a. for board, lodging, &c.

Applications, with copies of testimonials, to the Secretary, London Jewish Hospital.

METROPOLITAN HOSPITAL, Kingsland-road, London, E.8. (General—147 Beds.) CENTRAL GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER (casualty). Salary £670 p.a., less £130 p.a. residential charges.

Applications, stating age, nationality, qualifications and experience, together with 3 testimonials, to be sent to the Hospital Secretary immediately.

NATIONAL HOSPITALS FOR NERVOUS DISEASES. Applications are invited from registered medical practitioners for the appointment of REGISTRAR (whole-time) to the Lysholm X-ray Department at The National Hospital, Queen-square. This post usually carries the grade of Senior Registrar. Applicants should hold a Diploma in Diagnostic Radiology and have had experience in general radiology. The appointment will be for 1 year in the first instance.

Applications, with names of 3 referees, to be sent to the undersigned not later than 23rd January, 1954.

H. EWART MITCHELL, Secretary.

The National Hospital, Queen-square, W.C.1.

NATIONAL HOSPITALS FOR NERVOUS DISEASES. Applications are invited from registered medical practitioners for the appointment of REGISTRAR (whole-time) in the Department of Applied Electro-Physiology at The National Hospital, Queen-square, W.C.1. This post carries the grade of Registrar. The appointment will be for 1 year in the first instance with eligibility for reappointment.

Applications, giving the names of 3 referees, to be sent to the undersigned not later than 23rd January, 1954.

H. EWART MITCHELL, Secretary.

The National Hospital, Queen-square, W.C.1.

NATIONAL HOSPITALS FOR NERVOUS DISEASES. Applications are invited from registered medical practitioners for the appointment of 2 ASSISTANT HOUSE PHYSICIANS (non-resident) at The National Hospital, Queen-square, W.C.1. These posts carry the grade of Senior House Officer. The appointments will be for 6 months.

Applications, with names of 3 referees, to be sent to the undersigned not later than 23rd January, 1954.

H. EWART MITCHELL, Secretary.

The National Hospital, Queen-square, W.C.1.

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. ANÆSTHETIC REGISTRAR (non-resident) required for whole-time duties at hospitals in the Central Middlesex Group, viz., Acton Hospital, Gunnersbury-lane, W.3, Central Middlesex Hospital, Park Royal, N.W.10, and Willesden General Hospital, Harlesden-road, N.W.10. Officer would receive mileage allowance for use of car. Hospitals may be visited by direct appointment.

Application forms obtainable from and returnable to Group Secretary, Central Middlesex Group Hospital Management Committee, Acton-lane, N.W.10, by 20th January, 1954.

NEW END HOSPITAL, Hampstead, N.W.3. Applications are invited for the post now vacant of HOUSE PHYSICIAN for the Department of Endocrinology.

Applications, stating age, qualifications, and experience, together with copies of 2 recent testimonials and the name of 1 referee, to Surgeon-Superintendent, New End Hospital, Hampstead, N.W.3, by 18th January, 1954.

NELSON HOSPITAL, Kingston-road, Merton, S.W.20. ST. HELIER GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for appointment of RESIDENT HOUSE SURGEON, vacant 19th February. Salary £350–£450 p.a. according to experience. Post recognised for F.R.C.S.

Applications, stating age, experience and qualifications, with copies of 2 testimonials and the name of 1 referee, should be sent to the Group Secretary, St. Helier Hospital, Carshalton, Surrey.

PRINCE OF WALES'S GENERAL HOSPITAL, N.15. (219 Beds.) TOTTENHAM GROUP HOSPITAL MANAGEMENT COMMITTEE (GROUP 4). Applications are invited from registered medical practitioners for the appointment of SENIOR HOUSE OFFICER RESIDENT ANÆSTHETIST, for a period of 6 months, vacant middle of March, 1954.

Application form from Secretary, to be returned by 6th February, 1954.

PRINCE OF WALES'S GENERAL HOSPITAL, N.15. (219 Beds.) TOTTENHAM GROUP HOSPITAL MANAGEMENT COMMITTEE (GROUP 4), The Green, N.15. Applications are invited from qualified medical practitioners for appointment as RESIDENT JUNIOR HOUSE SURGEON for Casualty (pre-registration first or second post) for a period of 6 months, now vacant.

Application form from the Secretary.

PRINCE OF WALES'S GENERAL HOSPITAL, N.15. (219 Beds.) TOTTENHAM GROUP HOSPITAL MANAGEMENT COMMITTEE (GROUP 4), The Green, N.15. Applications are invited from registered medical practitioners for the appointment of RESIDENT HOUSE SURGEON to Orthopædic, Fracture and Traumatic Department, E.N.T. Department, and SENIOR CASUALTY OFFICER (second or third post) for a period of 6 months, now vacant.

Application form from Secretary.

POPLAR HOSPITAL, East India Dock-road, E.14. (120 Beds.) Required, HOUSE SURGEON (first, second, or third post). Duties include inpatient, outpatient, and casualty work. Post recognised for F.R.C.S. Vacant on 1st February.

Applications, stating age, nationality, and qualifications, to the Secretary.

QUEEN MARY'S HOSPITAL FOR THE EAST END, Stratford, E.15. HOUSE SURGEON (Male or Female) required (pre-registration first or second post) for 6 months commencing 11th February, 1954.

Applications, with copies of recent testimonials, to Group Secretary, West Ham Group Hospital Management Committee, Stratford, E.15, by 16th January, 1954.

QUEEN MARY'S HOSPITAL FOR THE EAST END, Stratford, E.15. PÆDIATRIC HOUSE PHYSICIAN required (third post); duties will include some work in related departments (e.g., Diabetic Clinic, &c.). 6 months appointment commencing 3rd February, 1954.

Applications, with copies of recent testimonials, to Group Secretary, West Ham Group Hospital Management Committee, Stratford, E.15, by 16th January, 1954.

QUEEN ELIZABETH HOSPITAL FOR CHILDREN MANAGEMENT COMMITTEE, Hackney-road, E.2, Shadwell, E.1, and BANSTEAD WOOD, SURREY. HOUSE OFFICER. This appointment will be made for 2 periods of 6 months commencing 1st March, 1954, and 1st September, 1954. First appointment as House Physician and second as House Surgeon and Casualty Officer.

Application forms may be obtained from the Secretary at Hackney-road and should be returned with copies of not more than 3 testimonials, on or before 23rd January, 1954.

QUEEN ELIZABETH HOSPITAL FOR CHILDREN MANAGEMENT COMMITTEE, Hackney-road, E.2, Shadwell, E.1, and BANSTEAD WOOD, SURREY. RESIDENT MEDICAL OFFICER (Male or Female) graded Senior House Officer at Hackney-road, E.2. Applications are invited for the above appointment to become vacant 1st April, 1954. Candidates must have had experience in the treatment of sick children. The appointment will be for 1 year. Salary £670 p.a., subject to a charge of £100 p.a. for residential emoluments.

Application forms may be obtained from the Secretary at Hackney-road, and should be returned, with copies of not more than 3 testimonials, not later than 30th January, 1954.

QUEEN CHARLOTTE'S AND CHELSEA HOSPITALS. CHELSEA HOSPITAL FOR WOMEN. HOUSE SURGEON (Senior House Officer), resident post for 1 year from 1st April, 1954.

Applications to be sent to the Secretary to the Board of Governors by 18th January, 1954, on forms obtainable from 339, Goldhawk-road, London, W.6.

QUEEN CHARLOTTE'S AND CHELSEA HOSPITALS. QUEEN CHARLOTTE'S MATERNITY HOSPITAL. JUNIOR OBSTETRIC OFFICER (Senior House Officer) resident post tenable for 6 months from 1st April, 1954.

Applications to the Secretary to the Board of Governors by 18th January, 1954, on forms obtainable from 339, Goldhawk-road, London, W.6.

ROYAL CANCER HOSPITAL, Fulham-road, London, S.W.3. Applications are invited from registered medical practitioners for the post of HOUSE SURGEON (resident). Salary £450 p.a. The post is tenable for 6 months from 1st March, 1954.

Forms of application are obtainable from the House Governor to whom applications (together with copies of 3 recent testimonials) should be sent not later than 20th January, 1954.

ROYAL NATIONAL ORTHOPÆDIC HOSPITAL, Brockley Hill, STANMORE, MIDDLESEX. Applications are invited for the post of RESIDENT SENIOR HOUSE OFFICER for a period of 6 months; duties to commence 8th March.

Applications to be received not later than 19th January. Forms of application can be obtained from the House Governor at 234, Great Portland-street, London, W.1.

ROYAL NATIONAL THROAT, NOSE AND EAR HOSPITAL, Gray's Inn-road, W.C.1, and Golden-square, W.1.

SENIOR HOUSE OFFICERS.

There will shortly be 2 vacancies in this grade. The appointments will be for initial periods of 6 months, and in accordance with the terms and conditions of service in the National Health Service. Applicants should have had good clinical experience in general surgery and in this specialty, and they should preferably hold a higher surgical qualification or should have passed the Primary F.R.C.S. examination.

Applications should give full information as to qualifications and experience and the names of 2 referees, and should reach the House Governor before 28th January, 1954.

RESIDENT HOUSE SURGEON (second or subsequent post).

There will be a vacancy on 1st February, 1954. 6 months appointment with salary as laid down for House Officer grades in the terms and conditions of service under the National Health Service.

Applications, stating age, qualifications, full details of previous experience (particularly in this specialty) with copies of 1–3 recent testimonials, should reach the House Governor before 21st January, 1954.

ROYAL NATIONAL THROAT, NOSE AND EAR HOSPITAL, Gray's Inn-road, W.C.1, and Golden-square, W.1. Applications are invited for a post of SENIOR REGISTRAR with effect from 1st March, 1954. The appointment will be for an initial period of 1 year, subject to annual re-election thereafter to a maximum of 4 years and otherwise in accordance with the terms and conditions of service in the National Health Service. Applicants must have had considerable experience in general surgery and in this specialty and hold a higher surgical qualification.

Applications should give full information as to qualifications and experience, the names of 2 referees, and should be sent in duplicate to the House Governor before 30th January.

ROYAL EYE HOSPITAL, S.E.1. King's College Hospital GROUP. Applications are invited for 2 posts of RESIDENT SENIOR HOUSE OFFICER starting on 1st April, 1954.

Applications, with copies of recent testimonials, should be made to the Secretary, The Royal Eye Hospital, St. George's-circus, S.E.1, by 16th February, 1954.

SPRINGFIELD HOSPITAL, Beechcroft-road, Upper Tooting, S.W.17. SPRINGFIELD HOSPITAL MANAGEMENT COMMITTEE, SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR required. The Hospital is a large one and offers excellent experience in diagnosis and treatment of all forms of mental disorder including the neuroses. Every variety of modern treatment is carried out in a well-equipped treatment centre. Single accommodation available for which a deduction of £130 p.a. will be made. Candidates may visit the Hospital by arrangement.

Apply to Hospital Secretary for application forms which should be returned, duly completed, on or before 23rd January, 1954.

ST. PETER'S, ST. PAUL'S AND ST. PHILIP'S HOSPITALS, W.C.2. RESIDENT SURGICAL OFFICER (Senior Registrar grade) required for St. Peter's Hospital on 1st April, 1954. Applications invited from Male candidates on the British register who have completed their training in general surgery. Appointment for 6 months, with opportunity for a further 6 months if recommended. Candidates should be prepared to spend 1 year at the Hospital if required.

Applications (12 copies), with 12 copies of 3 recent testimonials, should reach the House Governor, St. Peter's Hospital, Henrietta-street, W.C.2, by 6th February, 1954.

ST. PETER'S, ST. PAUL'S AND ST. PHILIP'S HOSPITALS, AND THE INSTITUTE OF UROLOGY. A vacancy will occur on 1st March, 1954, for the combined post of RESIDENT SURGICAL OFFICER at St. Philip's and FOLLOW-UP OFFICER to the Institute. Grading: Registrar first year. Appointment for 6 months with opportunity for extension.

Apply in writing (6 copies), and names of 2 referees, to the House Governor, St. Peter's Hospital, Henrietta-street, W.C.2. Closing date 31st January, 1954.

ST. GEORGE-IN-THE-EAST HOSPITAL, Raine-street, Wapping, London, E.1. Applications are invited for the post of HOUSE SURGEON (pre- or post-registration). Post vacant immediately. Tenable for 6 months. Salary, &c., in accordance with national scale.

Applications, stating age, qualifications, and experience, together with copies of 3 recent testimonials, to be forwarded to the Medical Superintendent.

ST. GEORGE'S HOSPITAL, S.W.1. Applications are invited for the post of HOUSE SURGEON (resident) in the grade of Senior House Officer to the Department of Neurosurgery at Atkinson Morley's Hospital, Wimbledon. The successful candidate will be required to take up duty as soon after 1st February, 1954, as possible.

Applications, giving details of age, education, experience, qualifications, and the names of 2 referees, should be received by the undersigned not later than 16th January, 1954.

P. H. CONSTABLE, House Governor.

ST. NICHOLAS HOSPITAL, Plumstead, S.E.18. Senior HOUSE OFFICER (Casualty Department), vacant 19th February. Recognised for F.R.C.S. Appointment for 6 months in first instance and may be renewed for further period. Salary £670 p.a., less £150 p.a. for residence.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

ST. NICHOLAS HOSPITAL, Plumstead, London, S.E.18. CASUALTY OFFICER (recognised for F.R.C.S.), vacant 1st February. 6 months appointment. Salary £350–£450 p.a., according to experience, less £100 p.a. for residence.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

ST. ANN'S GENERAL HOSPITAL, N.15. (756 Beds.) Applications are invited from registered medical practitioners for the appointment of RESIDENT HOUSE PHYSICIAN (Senior House Officer) for duty in the Infectious Diseases Unit and other general duties, for a period of 6 months commencing 1st February, 1954.

Application form from Secretary, Tottenham Group Hospital Management Committee, The Green, Tottenham, N.15, to be returned by 23rd January, 1954.

ST. CHARLES' HOSPITAL, Ladbroke-grove, W.10. (593 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (casualty) (1 of 2), non-resident, commencing 1st March, 1954.

Applications, stating age, qualifications, experience, together with the names and addresses of 2 referees, to be forwarded to the Hospital Secretary by 19th January, 1954.

ST. CHARLES' HOSPITAL, Ladbroke-grove, W.10. (593 Beds.) Applications are invited for the undermentioned posts commencing 1st February, 1954:—

HOUSE SURGEON (orthopædic, and some responsibility for E.N.T. and plastic beds). The post provides good opportunity for varied experience.

HOUSE PHYSICIAN (general duties), pre-registration post.

HOUSE PHYSICIAN (tuberculosis). The post provides excellent experience in medical and surgical treatment of pulmonary tuberculosis and facilities for investigation of non-tuberculosis pulmonary diseases.

Applications, stating age, qualifications, experience, together with the names and addresses of 2 referees, to be forwarded to the Hospital Secretary by 19th January, 1954.

ST. JOHN'S HOSPITAL, St. John's Hill, S.W.11. Senior HOUSE OFFICER. Duties mainly in Geriatric Department with some orthopædic work. Post offers excellent experience in these 2 fields.

Apply Medical Superintendent (L), with copies of 2 recent testimonials.

S.E. REGIONAL THORACIC SURGERY UNIT. (46 Beds.) BROOK GENERAL HOSPITAL, Shooters Hill-road, S.E.18. SENIOR HOUSE OFFICER (recognised for F.R.C.S.), vacant early February. The Unit treats all types of chest diseases and offers opportunity for comprehensive training in thoracic surgery. Appointment for 6 months in first instance and may be renewed for further period. Salary £670, less £150 p.a. for residence.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

WEST LONDON HOSPITAL, Hammersmith-road, London, W.6. Applications invited from registered medical practitioners for the post of HOUSE SURGEON (general and orthopædic), vacant 1st March.

Applications, stating age, qualifications, experience, copies of 2 recent testimonials, to Secretary by 17th January.

WANSTEAD HOSPITAL, Wanstead, E.11. Applications are invited for the post, now vacant, of CASUALTY OFFICER (graded as Senior House Officer). Salary £670 p.a., with a deduction of £120 p.a. for board, lodging, &c.

Applications, giving full particulars, together with copies of 2 recent testimonials, should be sent immediately to the Secretary Forest Group Hospital Management Committee, Laugthorne-road, E.11.

WOOLWICH GROUP HOSPITAL MANAGEMENT COMMITTEE. Locum REGISTRAR (resident or non-resident) in Orthopædic Surgery, vacant now. Full-time appointment on monthly basis. Salary £16 per week.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18 (WOOlwich 2670).

WESTMINSTER HOSPITAL, St. John's-gardens, S.W.1. Applications invited for post of SENIOR RESIDENT AND CASUALTY OFFICER. Appointment graded as Registrar and for 1 year in first instance from mid-February. Board-residence, £218 p.a.

Applications (8 copies), with names of 2 referees, to House Governor by 23rd January.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. There will be vacancies for the following Senior House Officers:—

2 HOUSE PHYSICIANS on 15th April, 1954.

1 HOUSE SURGEON on 1st April, 1954.

Further particulars and form of application, which must be returned not later than 1st February, 1954, are obtainable from the undersigned.

H. F. RUTHERFORD, House Governor and Secretary.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. There is a vacancy for a Part-time NON-RESIDENT REGISTRAR to the Orthopædic Department, for 1 session per week (Monday mornings).

Full particulars and form of application, which must be returned not later than Monday, 1st February, 1954, are obtainable from the undersigned.

H. F. RUTHERFORD, House Governor and Secretary.

AYLESBURY. ROYAL BUCKINGHAMSHIRE AND ASSOCIATED HOSPITALS MANAGEMENT COMMITTEE, AYLESBURY, BUCKS. Applications are invited for the following appointments:—

Royal Buckinghamshire Hospital

SENIOR HOUSE OFFICER for Accident and Orthopædic Department, vacant 17th January. Duties include charge of Casualty Department together with those of Senior Resident. Accommodation for a married person can also be provided from 1st April, 1954. Salary £670 p.a., less £140 p.a. for residence, &c.

SENIOR HOUSE OFFICER for Accident and Orthopædic Department, which is centred on this Hospital and comprises 48 Beds, vacant now.

Both posts are recognised for F.R.C.S.

HOUSE SURGEON to the Department of Ophthalmology which is centred on this Hospital and which conducts work at peripheral clinics. Vacant 17th February. Post is recognised for D.O. and duties will include some children's surgery.

Applications, with 2 testimonials, to Secretary Superintendent as soon as possible.

Stoke Mandeville Hospital

HOUSE PHYSICIAN (Senior Resident Medical Officer) for the Acute General Medical Unit, which comprises 2 Registrars and 3 Resident House Physicians. The post is of Senior House Officer grade. Vacant 23rd January, 1954.

SENIOR HOUSE OFFICER in Department of Neurology of the United Oxford Hospitals for duties at Stoke Mandeville Hospital. Vacant now.

Applications, with copies of 3 recent testimonials, to the Administrative Officer, Stoke Mandeville Hospital.

ASCOT, BERKS. HEATHERWOOD ORTHOPÆDIC HOSPITAL. (218 Beds—Adults and Children.) NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. ORTHOPÆDIC REGISTRAR (resident) required at above Hospital. Hospital is a regional centre for all general orthopædic conditions, including fractures; there is also a large amount of outpatient work. Post recognised for F.R.C.S. Candidates may visit Hospital by direct appointment.

Application forms obtainable from and returnable to the Group Secretary, Windsor Group Hospital Management Committee, Alma-road, Windsor, Berks, by 16th January, 1954.

ASCOT. HEATHERWOOD ORTHOPÆDIC HOSPITAL. RESIDENT HOUSE OFFICER (orthopædic) required immediately. Hospital a regional centre for all general and orthopædic conditions including fractures. National salary.

Applications, stating age, experience, and qualifications with names of 2 referees, to Hospital Secretary.

BEDFORD GENERAL HOSPITAL. (435 Beds.) 2 Resi-DENT HOUSE SURGEONS required (pre-registration posts). The appointments offer exceptional opportunities for general experience in a busy acute Surgical Unit.

Applications, stating age, nationality, qualifications, previous appointments, together with copies of 2 testimonials, should be forwarded to Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford.

BATH. ST. MARTIN'S HOSPITAL. Applications are invited from registered medical practitioners for the post of RESIDENT PATHOLOGIST at above Hospital. The successful applicant will work mainly in the Area Blood Bank at that Hospital, with duties at the Regional Blood Bank, Bristol, and at the Bath Central Laboratory. The post is graded Senior House Officer and is tenable for 1 year.

Applications, stating age, qualifications and experience, with 3 recent testimonials, should be forwarded to the undersigned as soon as possible.

J. LAWRENCE MEARS, Secretary,
Bath Hospital Management Committee.
Manor Hospital, Bath.

BATH. ST. MARTIN'S HOSPITAL. Applications are invited from registered medical practitioners for the post of HOUSE SURGEON at above Hospital.

Applications, stating age, qualifications and experience, with 3 testimonials, should be forwarded to—

J. LAWRENCE MEARS, Secretary.
Bath Hospital Management Committee.
Manor Hospital, Bath.

BATH. ROYAL UNITED HOSPITAL. Applications are invited from medical practitioners for post of HOUSE SURGEON at above Hospital.

Applications, stating age, qualifications and experience, with 3 testimonials, to be forwarded to—

J. LAWRENCE MEARS, Secretary.
Bath Hospital Management Committee.
Manor Hospital, Bath.

BATH (near). WINSLEY CHEST HOSPITAL. (135 Beds.) Applications are invited from registered medical practitioners for the post of RESIDENT HOUSE PHYSICIAN (Senior House Officer grade), at above Hospital. The Hospital overlooks the Limpley Stoke Valley about 7 miles from Bath and is served by a regular bus service.

Applications, stating age, qualifications and experience, with 3 recent testimonials, should be forwarded to—

J. LAWRENCE MEARS, Secretary,
Bath Hospital Management Committee.

Manor Hospital, Bath.

BARROW-IN-FURNESS. NORTH LONSDALE HOSPITAL. BARROW AND FURNESS HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for a post of HOUSE PHYSICIAN (recognised for pre-registration) at the North Lonsdale Hospital, Barrow-in-Furness, under supervision of Consultant Physician. National conditions and salary scale.

Applications to Group Secretary, 52, Paradise-street, Barrow-in-Furness.

BARROW-IN-FURNESS. NORTH LONSDALE HOSPITAL. ORTHOPÆDIC, TRAUMATIC AND CASUALTY SENIOR HOUSE OFFICER. Applications are invited for the above resident appointment. Hospital comprises 189 Beds with large Outpatients Department. Duties comprise service in the Orthopædic, Traumatic and Casualty Departments; post recognised for F.R.C.S. Salary £670 p.a., less £155 p.a. for emoluments.

Applications to the Group Secretary, Barrow and Furness Hospital Management Committee, 52, Paradise-street, Barrow-in-Furness.

BEXHILL HOSPITAL, Bexhill, Sussex. (62 Beds.) 2 HOUSE SURGEONS. Posts now vacant. A small modern hospital on the South Coast, considerable acute surgical work and busy Outpatient Department, excellent all-round experience. National scale of salary.

Apply to Hospital Administrator.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. GENERAL HOSPITAL. Applications are invited for the post of SURGICAL REGISTRAR (resident), Registrar grade. The successful candidate will be required to work mainly in the Traumatic and Casualty Departments of the above Hospital. There will also be facilities for clinical experience with other surgical units. The post is tenable for 1 year in the first instance. Candidates must be registered medical practitioners and have held a resident appointment in an approved hospital. Preference will be given to those holding a higher qualification.

Forms of application may be obtained from, and should be returned as soon as possible, to the Secretary, United Birmingham Hospitals, Queen Elizabeth Hospital, Edgbaston, Birmingham, 15.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. THE QUEEN ELIZABETH HOSPITAL. Applications are invited for the post of RESIDENT MEDICAL OFFICER (Registrar grade) for duty at the above Hospital. The post is tenable for 1 year in the first instance. Candidates must be registered medical practitioners, and have held a resident appointment.

Forms of application may be obtained from, and should be returned not later than 16th January, 1954, to, the Secretary, United Birmingham Hospitals, Queen Elizabeth Hospital, Birmingham, 15.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. Applications are invited for the appointment of REGISTRAR (E.N.T. Department), non-resident, for duties within the constituent hospitals of the Teaching Group, including the Children's Hospital, and to commence on 1st March, 1954. Applicants should have had previous experience in the specialty and a higher qualification is desirable.

Forms of application may be obtained from the Secretary, United Birmingham Hospitals, Queen Elizabeth Hospital, Edgbaston, Birmingham, 15, and should be returned not later than 16th January, 1954.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. THE CHILDREN'S HOSPITAL, Ladywood-road, BIRMINGHAM, 16. Applications are invited for the appointment of RESIDENT SENIOR HOUSE OFFICER (clinical pathology), vacant on 1st April, 1954, for 1 year. Applicants should have held resident appointments in a Children's Hospital or a Children's Department of a general hospital. The successful applicant will be required to work in the Clinical Pathological Department.

Forms of application may be obtained from the House Governor, and should be returned not later than 30th January, 1954. G. A. PHALP, Secretary to the Board of Governors.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. THE CHILDREN'S HOSPITAL, Ladywood-road, BIRMINGHAM, 16. SENIOR HOUSE OFFICER (casualty) required to commence duty on 1st April, 1954. Previous surgical experience essential.

Forms of application may be obtained from the House Governor, and should be returned not later than 25th January, 1954. G. A. PHALP, Secretary to the Board of Governors.

BIRMINGHAM, 18. DUDLEY ROAD HOSPITAL. 2 SENIOR HOUSE OFFICERS (resident) in Anæsthetics required. Experience not essential. Centred at Dudley Road Hospital (800 Beds), but will include duties and a period of residence at other hospitals in the Group. Appointments recognised for training for Diploma in Anæsthetics and F.F.A. R.C.S. Duties include list and emergency work in general surgery, E.N.T., obstetrics and gynæcology.

Applications, with copies of 2 recent testimonials, to the Secretary.

BIRMINGHAM. ST. CHAD'S HOSPITAL, Hagley-road, BIRMINGHAM, 16. HOUSE PHYSICIAN required from 1st February, 1954. Post recognised under Medical Act, 1950, for Pre-registration Service.

Detailed applications, with recent testimonials, to the Secretary, Dudley Road Hospital, Birmingham, 18.

BIRMINGHAM REGIONAL HOSPITAL BOARD.

(*a*) **West Bromwich Group of hospitals**
Whole-time REGISTRAR in Anæsthetics. Duties at Midland Centre for Neurosurgery, Smethwick Hospital, and other Group hospitals. Experience specialty required.

(*b*) **North Staffs. Royal Infirmary, Stoke-on-Trent**
Whole-time REGISTRAR in Anæsthetics. Recognised for D.A. Experience specialty required. Resident.

(*c*) **Coventry Group of hospitals**
Whole-time REGISTRAR in Anæsthetics. Duties at Manor and George Eliot Hospitals, Nuneaton. Recognised for D.A. Experience specialty required.

(*d*) **Kidderminster General Hospital**
Whole-time REGISTRAR in General Surgery. Experience specialty essential. Higher qualification an advantage. Resident. Married quarters available.

(*e*) **Stafford. St. George's Hospital** (1344 Beds)
Whole-time REGISTRAR in Psychiatry. Single or married accommodation available. Experience specialty essential. Possession of higher qualification an advantage. Recognised for D.P.M.

(*f*) **Coventry and Warwickshire Hospital**
Whole-time REGISTRAR in Paediatrics. Recognised for D.C.H. Experience specialty required. Non-resident.

(*g*) **Coventry Group of hospitals**
Whole-time REGISTRAR in Ophthalmology. Duties mainly at Coventry and Warwickshire Hospital (36 ophthalmic beds). Diploma in Ophthalmology required. Post offers operative experience and approved for F.R.C.S. Non-resident.

Application forms from Secretary, 10, Augustus-road, Birmingham, 15, to be returned before 25th January, 1954.

BIRMINGHAM. SOLIHULL HOSPITAL, Lode-lane, SOLIHULL.

RESIDENT SURGICAL OFFICER (Senior House Officer). Good experience in general surgery, and 5 other Resident Medical staff.

HOUSE PHYSICIAN required. Post vacant mid-January and offers good experience in a general hospital with 5 other Resident Medical staff.

Applications, stating age, qualifications, nationality and experience, with copies of 2 recent testimonials or names for reference, to the Medical Superintendent.

BIRMINGHAM AND MIDLAND EYE HOSPITAL, Church-street, BIRMINGHAM, 3. HOUSE SURGEON required immediately. Appointment is for 6 months but renewable. Hospital carries resident staff of 4 and provides 2-year course of instruction, which is recognised for the Diploma of D.O. (Eng.) and F.R.C.S. (Eng.) in Ophthalmology. Wide experience available in all branches, including surgery.

Applications, stating age, nationality, qualifications, and experience, to Secretary, Dudley Road Hospital, Birmingham, 18.

BIRMINGHAM ACCIDENT HOSPITAL AND REHABILITATION CENTRE, Bath-row, BIRMINGHAM, 15. (215 Beds.) Applications are invited from registered medical practitioners for post of RESIDENT ANÆSTHETIST (Senior House Officer grade) which falls vacant on 1st February, 1954. Salary at rate of £670 p.a., less deduction of £140 p.a. in respect of residential emoluments. Training will be given by Consultant staff in modern anæsthetic methods. Previous experience in anæsthetics not essential.

Applications, with copies of 2 testimonials or names of 2 referees, should be sent to Administrator as soon as possible.

BIRMINGHAM ACCIDENT HOSPITAL AND REHABILITATION CENTRE, Bath-row, BIRMINGHAM, 15. (215 Beds.) HOUSE SURGEONS (Male or Female). 2 posts vacant in February, 1 post vacant in March. Recognised for F.R.C.S. The appointments will be for a period of 6 months of which 2 may be spent in the Burns Unit (Medical Research Council). The Hospital is the largest Traumatic Unit in the country, and treats 50,000 new patients each year. Posts are open to registered practitioners and offer ample opportunity for practical experience in the management of all types of injury and teaching by the Consultant staff.

Applications, with copies of recent testimonials or names of 2 referees, to the Administrator.

BISHOP'S STORTFORD, HERTS. HAYMEADS HOSPITAL. (400 Beds. Midway between London and Cambridge. Main Line Railway from Liverpool Street.) Applications are invited for the post of SENIOR HOUSE OFFICER (medical) for duties mainly in the Tuberculosis Unit of 43 male and 23 female beds. Salary £670 p.a., less £130 p.a. in respect of residential emoluments provided. Appointments to commence as soon as possible.

Applications, stating age, nationality, qualifications, and experience, with copies of recent testimonials or the names of referees, to the Hospital Secretary.

BLACKPOOL. VICTORIA HOSPITAL. (344 Beds.)
(1) SENIOR HOUSE OFFICER (Department of Medicine).
(2) SENIOR HOUSE OFFICER (anæsthetics). Recognised for D.A. and F.F.A.
(3) SENIOR HOUSE OFFICER (Orthopædic and Casualty Departments). Recognised for 6 months casualty training for Final F.R.C.S. examination.
(4) SENIOR HOUSE OFFICER (E.N.T. Department). Recognised for D.L.O. and F.R.C.S.
(5) HOUSE OFFICER (E.N.T. Department). Recognised for D.L.O.
(6) HOUSE SURGEON (casualty and orthopædics). Recognised for 6 months casualty training for Final F.R.C.S. examination.
(7) RESIDENT HOUSE SURGEONS (Surgical Department). 2 posts: 1 now vacant, 1 vacant 15th February, 1954. Recognised for F.R.C.S.

This is a busy General Hospital with a large Outpatient Department and the posts offer excellent opportunities for experience under Consultant staff.

Applications, with references, to the Hospital Secretary.

BLACKPOOL AND FYLDE HOSPITAL MANAGEMENT COMMITTEE. DEVONSHIRE ROAD I.D. HOSPITAL, BLACKPOOL. (128 Beds.) SENIOR HOUSE OFFICER (resident) with duties in connection with care of beds under the Group Consultant Pædiatrician at the Victoria Hospital (General—344 Beds), and the "Glenroyd" Maternity Hospital, Blackpool (60 Beds), and duties at the Devonshire Road Infectious Diseases Hospital. Post is vacant 10th February, 1954, and provides good opportunities for gaining experience in child health and infectious diseases.

Applications, with references or names of referees, should be sent to the Group Secretary, Victoria Hospital, Blackpool.

BISHOP AUCKLAND GENERAL HOSPITAL. (350 Beds.) SOUTH WEST DURHAM HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered or pre-registration practitioners for 2 posts of HOUSE SURGEON—1 in general surgery (72 Beds), 1 in orthopædics (48 Beds). Salary £350–£450 p.a. according to previous experience, less £100 p.a. for full residential emoluments.

Applications, stating age, nationality, qualifications, experience, and the names of 2 referees, to be sent to the undersigned as soon as possible.

K. G. T. LUXFORD, Group Secretary/Finance Officer.
The General Hospital, Bishop Auckland.

BISHOP AUCKLAND GENERAL HOSPITAL. (350 Beds.) Applications are invited from registered or pre-registration practitioners for the post of HOUSE SURGEON (obstetrics and gynæcology) available 7th February, 1954, departmental beddage 66; appointment recognised for D.Obst.R.C.O.G. Salary £350–£450 p.a. according to previous posts held, less £100 p.a. for full residential emoluments.

Applications, stating age, nationality, qualifications and experience, to be sent with names of 2 referees, to the undersigned as soon as possible.

K. G. T. LUXFORD, Secretary/Finance Officer,
South West Durham Hospital Management Committee.
The General Hospital, Bishop Auckland.

BIDEFORD AND DISTRICT HOSPITAL. (51 Beds.) HOUSE OFFICER required. Flat available for married Officer.

Applications to Group Secretary, North Devon Hospital Management Committee, 19, Alexandra-road, Barnstaple.

BLACKBURN (near). CALDERSTONES HOSPITAL. WHALLEY, near BLACKBURN. (For Mental Defectives—2300 Beds.) CALDERSTONES HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of JUNIOR HOSPITAL MEDICAL OFFICER. Salary scale £700–£50–£1000 p.a. and other conditions of service in accordance with the terms and conditions of service for hospital medical and dental staffs under the National Health Service. The appointment is subject to the provisions of the National Health Service (Superannuation) Regulations, 1950/52. An unfurnished house is available for rent to a married man, and residential quarters are available for a single man at a charge of £190 p.a.

Applications, stating age, qualifications, and experience, together with the names of 3 referees, to be submitted to the Medical Superintendent, Calderstones Hospital, Whalley, near Blackburn, as soon as possible.

BLACKBURN AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (anæsthetics) required. Residence, and duties mainly, at Queen's Park Hospital, Blackburn, with sessions at the Blackburn Royal Infirmary and Accrington Victoria Hospital as arranged by the Consultant Anæsthetist. Post recognised for D.A. and F.F.A. R.C.S.

Apply to the Secretary, Hospital Management Committee Office, Royal Infirmary, Blackburn.

BOVEY TRACEY (near), SOUTH DEVON. THORACIC SURGICAL CENTRE FOR DEVON (including Plymouth Area). SENIOR HOUSE OFFICER required for this Centre situated at Hawkmoor Chest Hospital. Both non-tuberculous and tuberculous thoracic surgical work is undertaken. Valuable experience in chest diseases is offered and previous experience in this branch, although desirable, is not essential. Resident single accommodation available.

Applications, stating age, qualifications, and experience, together with copies of testimonials, or names of referees, to be sent to the Group Secretary, Exeter Special Hospital Management Committee, 26, Queen-street, Exeter, as soon as possible.

BOVEY TRACEY (near), SOUTH DEVON. HAWKMOOR CHEST HOSPITAL. (214 Beds with Thoracic Surgical Unit.) 2 SENIOR HOUSE OFFICERS required, 1 to serve jointly in the Surgical and Medical Departments and 1 for the medical wards. Resident single accommodation available.

Applications, stating age, qualifications, and experience, with names of referees, to be sent to the Group Secretary, Exeter Special Hospital Management Committee, 26, Queen-street, Exeter, as soon as possible.

BRAINTREE, ESSEX. BLACK NOTLEY HOSPITAL. (544 Beds.) Applications invited for post of HOUSE OFFICER (orthopædic surgery). (First, second, or third post.) Post tenable for 6 months and is recognised under F.R.C.S. regulations. Salary in accordance with the terms of service issued by the Ministry of Health, plus £50 p.a.

Applications, with copies of 3 testimonials, should be forwarded to the Group Secretary, Colchester Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

BRAINTREE, ESSEX. BLACK NOTLEY HOSPITAL. (544 Beds.) Applications invited for post of HOUSE PHYSICIAN in the medical and pædiatric wards of the above Hospital. First, second, third, or pre-registration post, tenable for 6 months from 19th February. Salary in accordance with the terms of service issued by the Ministry of Health, plus £50 p.a.

Applications, with copies of 3 testimonials, should be forwarded to the Group Secretary, Colchester Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of REGISTRAR in Orthopædic Surgery for the above Hospital Group consisting of 18 hospitals with 1548 Beds. The orthopædic work is conducted mainly at the 2 major hospitals of the Group, viz., Royal Victoria Hospital, Bournemouth, and Poole General Hospital, with 100 orthopædic beds and large Outpatient Departments covering both traumatic and non-traumatic orthopædics in all branches in children and adults.

Forms of application, obtainable from the Group Secretary, Hospital Management Committee Office, Royal Victoria Hospital, Bournemouth, should be returned to him, duly completed, within 14 days of the appearance of this advertisement.

BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. ROYAL VICTORIA HOSPITAL, WEST-BOURNE, BOURNEMOUTH, HANTS. Applications are invited for the appointment of HOUSE SURGEON for E.N.T. and ophthalmic duties. In addition to the duties at the above Hospital, the successful candidate will be required to assist in E.N.T. Outpatient Clinics at the Royal Victoria Hospital, Boscombe, Bournemouth and Poole General Hospital. The appointment is recognised for the D.O. and D.L.O. Diplomas.

Applications to the Deputy Hospital Secretary, Royal Victoria Hospital, Shelley-road, Boscombe, Bournemouth.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL, Shelley-road. (492 Beds.) BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. RESIDENT ANÆSTHETIST (Senior House Officer) required immediately. The post is recognised for the D.A. and F.F.A. R.C.S. and is tenable for 12 months. Experience in chest anæsthesia available.

Applications to the Deputy Hospital Secretary.

BOLTON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. BOLTON DISTRICT GENERAL HOSPITAL. (545 Beds.)

RESIDENT SENIOR HOUSE OFFICER in Medicine. Vacant immediately, tenable for 12 months.

RESIDENT HOUSE SURGEON for general surgical duties. Vacant immediately, tenable for 6 months and recognised under the Pre-registration Service scheme. Also recognised for F.R.C.S.

Applications, stating age, nationality, qualifications and experience, and the names of 2 referees, should be sent immediately to H. P. TRAVIS, Group Secretary.

The Royal Infirmary, Bolton.

BRISTOL CLINICAL AREA. The Board of Governors of THE UNITED BRISTOL HOSPITALS AND THE SOUTH-WESTERN REGIONAL HOSPITAL BOARD. Applications are invited by the above Boards from registered medical practitioners for the joint appointment of REGISTRAR in Anæsthetics to Frenchay Hospital, Bristol, which is the Regional Centre for neuro, plastic, and thoracic surgery. Facilities for training in these specialised branches of anæsthetics are available. The appointment will be held for 1 year in the first instance, and be renewable for a further year.

Applications, stating date of birth, qualifications and experience together with the names and addresses of 2 referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 23rd January, 1954.

BRIGHTON. NEW SUSSEX HOSPITAL FOR WOMEN, Windlesham-road, BRIGHTON. HOUSE PHYSICIAN (Female) for a period of 6 months from 7th February, 1954. Salary at the rate of £350–£450 p.a., according to experience, less £100 p.a. residential emoluments.

Applications, stating age, nationality, qualifications and experience, together with copies of recent testimonials, to the Administrative Officer, as soon as possible. Pre-registration candidates may also apply.

BRIGHTON. ROYAL SUSSEX COUNTY HOSPITAL. CASUALTY HOUSE SURGEON (1 of 3) including duties with Orthopædic and Traumatic Unit. Pre-registration and recognised for F.R.C.S. from 1954. Vacant now.

Applications, stating age, qualifications and experience, with the names and addresses of 2 referees, to the Administrative Officer, Royal Sussex County Hospital, Brighton.

BRIGHTON. ROYAL ALEXANDRA HOSPITAL FOR SICK CHILDREN, Dyke-road, BRIGHTON. (130 Beds.) HOUSE SURGEON for 6 months from 6th February, 1954. Duties include a certain amount of medical work; the post is recognised for D.C.H. and is open to pre-registration candidates.

Applications, stating age, nationality, qualifications and experience, together with copies of recent testimonials, to the Administrative Officer, on or before 22nd January, 1954.

BURTON-ON-TRENT GENERAL INFIRMARY. (240 acute beds.) JUNIOR HOSPITAL MEDICAL OFFICER required for Casualty and Orthopædic Departments.

Applications, with full details, naming 2 referees, to Secretary.

BURY AND ROSSENDALE HOSPITAL MANAGEMENT COMMITTEE.

Bury General Hospital

HOUSE OFFICER (surgical), pre-registration post.

SENIOR HOUSE OFFICER (surgical), resident or non-resident.

CLINICAL PATHOLOGIST (Senior House Officer grade), resident or non-resident. Opportunities for gaining experience in all branches of pathology.

SENIOR HOUSE OFFICER (anæsthetics), resident or non-resident. Recognised for D.A.

Applications, stating experience, qualifications, &c., with names of 2 referees, should be made to—

H. WILKINSON, Esq., Group Secretary.
Bury General Hospital, Bury, Lancs.

CHESTERFIELD ROYAL HOSPITAL. Chesterfield HOSPITAL MANAGEMENT COMMITTEE. A CASUALTY OFFICER (pre-registration House Officer or Senior House Officer) is required immediately at above Hospital. National salary and conditions.

Apply M. H. BOONE, Secretary.

CHESTERFIELD ROYAL HOSPITAL. Chesterfield HOSPITAL MANAGEMENT COMMITTEE. A HOUSE SURGEON (pre-registration House Officer or Senior House Officer) is required immediately at above Hospital. National salary and conditions.

Apply M. H. BOONE, Secretary.

CHELMSFORD AND ESSEX HOSPITAL. (163 Beds.) Applications are invited for the post of RESIDENT HOUSE SURGEON (pre-registration post). The post will become vacant on 8th February and offers good surgical experience and is recognised for the F.R.C.S.

Applications, together with 2 recent testimonials, to the Secretary, Chelmsford Hospital Management Committee, London-road, Chelmsford.

CHELMSFORD AND ESSEX HOSPITAL, London-road, CHELMSFORD. (163 Beds.) Applications are invited for the post of HOUSE PHYSICIAN (pre-registration post) to work in the general medical wards at the above Hospital. Duties will commence approximately 20th January.

Applications, with copies of 3 recent testimonials, should be sent to the Secretary, Chelmsford Hospital Management Committee, London-road, Chelmsford.

CHELMSFORD. ST. JOHN'S HOSPITAL. Applications are invited for the appointment of JUNIOR RESIDENT SURGICAL OFFICER (Senior House Officer grade) at above Hospital. The post is recognised for the F.R.C.S. and is now vacant. The successful candidate will gain wide experience in general surgery, and will be expected to supervise the work of the House Surgeon.

Applications, stating age, nationality, present appointment and previous appointments (both with dates), together with names and addresses of 2 referees, to be sent to—

R. G. MORRISH, Group Secretary.

Chelmsford and Essex Hospital, London-road, Chelmsford.

CHELMSFORD. ST. JOHN'S HOSPITAL. Applications are invited for the post of RESIDENT PÆDIATRIC HOUSE OFFICER (Male or Female) commencing 22nd January, 1954, to work in the Pædiatric Unit of the Chelmsford Hospital Group. The Unit includes a Premature Baby Nursery of 10 Cots and a Neonatal Department in the Maternity Block of the Hospital. The work is recognised for the D.C.H. Preference will be given to applicants who have already held a house appointment.

Applications, together with recent testimonials, should be sent not later than 12th January, 1954, to the Secretary, Hospital Management Committee—Chelmsford Group, Chelmsford and Essex Hospital, London-road, Chelmsford.

COVENTRY GROUP 20 HOSPITAL MANAGEMENT COMMITTEE invites applications for the following posts :—

Coventry and Warwickshire Hospital (346 Beds)

SENIOR HOUSE OFFICER in General Surgery (94 Beds). Recognised for F.R.C.S. Excellent experience in all types of general surgery.

SENIOR HOUSE OFFICER or HOUSE OFFICER (fracture and orthopædic), for casualty duties. Recognised for F.R.C.S. and pre-registration.

Coventry Hospitals

RESIDENT SENIOR HOUSE OFFICER in Anæsthetics, vacant now. Salary £670 p.a. Recognised for F.F.A.R.C.S. Excellent experience in all types of general anæsthetics. Duties at Coventry and Warwickshire Hospital and Gulson Hospital.

Nuneaton, Manor Hospital (139 Beds)

HOUSE SURGEON for general surgical duties (including E.N.T. and ophthalmic). Recognised for F.R.C.S. and pre-registration.

HOUSE SURGEON (Fracture and Orthopædic Department —50 Beds), vacant now. Post offers good experience of accident surgery. Recognised for F.R.C.S. and pre-registration.

RECEIVING ROOM OFFICER. Salary scale £700–£1000 p.a. Required immediately.

Rugby. Hospital of St. Cross (168 Beds)

HOUSE SURGEON for General Surgical Department (48 Beds) required 14th January, 1954. Post recognised for F.R.C.S. and approved for Pre-registration Service.

HOUSE SURGEON (fracture and orthopædic). Post vacant 9th January, 1954. Recognised for F.R.C.S. and pre-registration.

Rugby. Hospital of St. Cross and St. Luke's Hospital

SENIOR HOUSE OFFICER (resident) for General Medicine Department (60 Beds and 2 outpatient clinics weekly). Post vacant 1st February, 1954.

Applications to Secretary, Group 20 Hospital Management Committee, Stoney Stanton-road, Coventry.

COLCHESTER. ESSEX COUNTY HOSPITAL. Locum SENIOR REGISTRAR in Radiology required. Salary £22 a week.

Applications, with copies of 3 testimonials, should be sent to the Group Secretary, Colchester Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

COLCHESTER HOSPITAL MANAGEMENT COM-MITTEE. BLACK NOTLEY HOSPITAL, BRAINTREE, AND ESSEX COUNTY HOSPITAL, COLCHESTER. Applications invited for post of HOUSE SURGEON. First, second, third or pre-registration post, tenable for 6 months from 14th February. Duties to include work in general surgical and gynæcological wards. Salary in accordance with the terms of service issued by the Ministry of Health, plus £50 p.a. Recognised under F.R.C.S. regulations.

Applications, with copies of 3 testimonials, should be forwarded to the Group Secretary, 14, Pope's-lane, Colchester, Essex.

CARDIFF. THE UNITED CARDIFF HOSPITALS AND THE WELSH REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of SENIOR REGISTRAR in the Department of Anæsthetics.

Application forms can be obtained from the Secretary, The United Cardiff Hospitals, Cardiff Royal Infirmary, Newport-road, Cardiff.

CARDIFF. THE UNITED CARDIFF HOSPITALS. Applications are invited for the appointment of RESIDENT SURGICAL REGISTRAR with duties in the Department of Thoracic Surgery at Llandough Hospital.

Application forms can be obtained from the Secretary, The United Cardiff Hospitals, Cardiff Royal Infirmary, Newport-road, Cardiff.

CHICHESTER. ROYAL WEST SUSSEX HOSPITAL. (202 acute beds.) RESIDENT HOUSE SURGEON required for 6 months appointment. National salary scale for first, second, or third posts. Post approved for pre-registration practitioners. Post recognised for F.R.C.S. • 6 residents including Resident Surgical Officer and 3 House Surgeons. Vacant from 16th January, 1954.

Apply to the Senior Administrative Officer.

CHELTENHAM GENERAL HOSPITAL. (220 Beds.) Recognised pre-registration appointment. CHELTENHAM GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the position of HOUSE SURGEON. Salary at the rate of £350, £400, of £450 p.a., less £100 residential emoluments.

Applications, stating age, qualifications, experience, and enclosing copy testimonials, should be sent to the Secretary, Group Management Committee, General Hospital, Cheltenham.

CREWE AND DISTRICT MEMORIAL HOSPITAL. Whole-time RESIDENT SURGICAL REGISTRAR, vacant shortly. Appointment for 1 year, renewable for second year. Salary £775–£890, less a deduction of £155 for residential emoluments.

Applications, with copies of testimonials or names of 3 referees, to the Group Secretary, Barony Hospital, Nantwich, Cheshire.

CUCKFIELD HOSPITAL, Cuckfield, Sussex. Mid-SUSSEX HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER for medical wards. National Health Service conditions of service. Salary £670 p.a., subject to residential charge of £150 p.a. Post will be vacant January, 1954.

Applications, stating age, qualifications and full details of experience, also giving the names of 2 referees, should be addressed to the Group Secretary at the above address.

CUCKFIELD HOSPITAL, Cuckfield, near Haywards HEATH, SUSSEX. MID-SUSSEX HOSPITAL MANAGEMENT COMMITTEE. HOUSE OFFICER (resident), obstetrics and gynæcology, required for Maternity Unit of 35 Beds and Gynæcology Unit of 8 Beds. The post becomes vacant on 16th January, 1954. National salary scale and conditions of service.

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, should be sent to the Group Secretary at the above address within 10 days of the appearance of this advertisement.

DOUGLAS. NOBLE'S ISLE OF MAN HOSPITAL. HOUSE SURGEON required. House Officer grade post, now vacant. Hospital approved for Pre-registration Service, has busy general surgical practice, including gynæcology and operative obstetrics. Duties include casualty rota duty, assistance in outpatient and fracture clinics, and in the operating-theatres, and the care of surgical inpatients. 4 residents on staff. National salary scale.

Applications, giving full particulars, with copies of 2 recent testimonials, to the Secretary, Noble's Hospital, Douglas, Isle of Man.

DORCHESTER. DORSET COUNTY HOSPITAL. (113 Beds.) HOUSE SURGEON required (Male or Female), post now vacant and tenable for 6 months. Recognised for F.R.C.S. examination and approved for Pre-registration Service.

Applications, stating age, experience, qualifications and nationality, together with copy testimonials, to Group Secretary, West Dorset Group Hospital Management Committee, Damers-road, Dorchester, immediately.

DOVER. ROYAL VICTORIA HOSPITAL. Applications are invited for the post of HOUSE SURGEON at the above Hospital. The post is recognised by the Royal College of Surgeons. Salary £350, £400, or £450 a year according to experience. A deduction of £100 a year will be made for residential emoluments.

Applications, stating age, qualifications, and the names and addresses of 2 referees, to the Group Secretary, " Ash-Eton," Radnor Park West, Folkestone.

DUMFRIES. CRICHTON ROYAL MENTAL HOSPITAL. Applications are invited from registered medical practitioners for the post of HOUSE OFFICER. The post is recognised under the Medical Act, 1950, for Pre-registration Service. Salary according to national scale plus £50 p.a. Previous experience in psychiatry not required. Every facility for training in psychiatry on the most modern lines.

Forms of application to be obtained from the Physician-Superintendent to whom they should be returned with copies of testimonials.

DERBY. DERBYSHIRE ROYAL INFIRMARY. House PHYSICIAN (pre-registration) or SENIOR HOUSE OFFICER, vacant 20th February, 1954.

Applications, with copies of 2 recent testimonials, should be sent to the Secretary at the Infirmary.

DEWSBURY. STAINCLIFFE GENERAL HOSPITAL. (314 Beds.) HOUSE OFFICER (general medicine and dermatology), first, second or third post, vacant 1st March, and tenable for 6 months. Recognised pre-registration appointment. The Hospital has 68 acute medical beds.

Applications, with full particulars, to the Administrative Officer at the Hospital.

DEWSBURY. STAINCLIFFE GENERAL HOSPITAL. (314 Beds.) HOUSE OFFICER (general medicine and pediatrics), first, second, or third post, vacant February and tenable for 6 months. Recognised pre registration appointment. Hospital has 68 adult acute medical and 34 paediatric beds. It is recognised for the D.C.H.

Applications, with full particulars to the Administrative Officer at the Hospital.

DEWSBURY. STAINCLIFFE GENERAL HOSPITAL (314 Beds.) RESIDENT SURGICAL OFFICER (Senior House Officer grade). Post now vacant. The Surgical Unit comprises 66 Beds and the Hospital is recognised for the F.R.C.S.

Applications, giving full details, to the Administrative Officer at the Hospital.

DARLINGTON MEMORIAL HOSPITAL. (210 Beds.) DARLINGTON DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE SURGEON (resident), which post is recognised for the F.R.C.S. (Eng.). Salary in accordance with national scale.

Apply, giving age and references, to the undersigned forthwith. G. W. BECKWITH, Group Secretary.

EAST ANGLIAN REGIONAL HOSPITAL BOARD. RESIDENT SURGICAL OFFICER, Stamford and Rutland Hospital, Stamford. Applicants should have experience in emergency surgery and obstetrics. Single accommodation available. Salary on the scale £775–£890. Appointment for 1 year, renewable for second year.

Detailed applications, including age and names of 3 referees, to Secretary of Board, 117, Chesterton-road, Cambridge, by 25th January, 1954. Candidates invited to visit Hospital by direct arrangement with Hospital Management Committee Secretary, Memorial Hospital, Peterborough.

EAST ANGLIAN REGIONAL HOSPITAL BOARD. REGISTRAR in Obstetrics and Gynæcology at hospitals in the East Suffolk and Ipswich Area. Main hospital Ipswich Borough General Hospital (50 obstetric and 30 gynæcology beds). Post provides wide experience and recognised for M.R.C.O.G. Single accommodation available. Appointment for 1 year, renewable for second year.

Detailed applications, including age and names of 3 referees, to Secretary of Board, 117, Chesterton-road, Cambridge, by 25th January, 1954. Candidates invited to visit hospitals by direct arrangement with Hospital Management Committee Secretary at East Suffolk and Ipswich Hospital, Ipswich.

EAST CUMBERLAND HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following HOUSE OFFICER appointments for the 6 months period commencing 1st February, 1954 :—

Cumberland Infirmary, Carlisle (340 Beds)

•3—General Surgery.
1—Gynæcology and Obstetrics.
1—Orthopædics.
1—" Specials " (E.N.T. and Eyes).

•2 of the General Surgical posts are designated pre-registration appointments under the Medical Act, 1950.

Applications, with names of 2 referees, should be forwarded immediately to the Secretary, East Cumberland Hospital Management Committee, Cumberland Infirmary, Carlisle.

EAST LOTHIAN. EAST FORTUNE HOSPITAL (Tuberculosis). SENIOR HOUSE OFFICER (resident) required immediately. This is a modern hospital of 360 Beds with an Outpatient Department, offering excellent experience in all modern methods of treatment. Thoracic, orthopædic, and genito-urinary surgery are done regularly in the Hospital.

Applications, stating age, sex, nationality, and experience, with the names of 2 referees, to Secretary, East Lothian Hospitals Group Board of Management, 31, Court-street, Haddington.

EDGWARE GENERAL HOSPITAL AND BUSHEY MATERNITY HOSPITAL. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Whole-time RESIDENT OBSTETRICAL AND GYNÆCOLOGICAL REGISTRAR required at above Hospitals. M.R.C.O.G. desirable. Department has 130 obstetrical and 40 gynæcological beds. Hospital may be visited by direct appointment.

Application forms obtainable from, and returnable to, Group Secretary, Edgware General Hospital, Edgware, Middlesex, by 19th January, 1954.

EDGWARE GENERAL HOSPITAL. (715 Beds.) NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Part-time SENIOR REGISTRAR in Dermatology required for 2 half-day sessions per week at above Hospital. Hospital may be visited by direct appointment with Medical Director.

Application forms obtainable from and returnable to Group Secretary, Hendon Group Hospital Management Committee, Edgware General Hospital, Edgware, Middlesex, by 19th January, 1954.

EDGWARE GENERAL (formerly Redhill County) HOSPITAL, EDGWARE, MIDDLESEX. RESIDENT PÆDIATRIC HOUSE PHYSICIAN for above Hospital. Post vacant 10th February, 1954. Salary £350–£450 p.a., according to experience. Deduction of £100 p.a. for board, lodging, &c. 6 months appointment.

Applications, together with copies of up to 3 recent testimonials, to Medical Director of Hospital by 16th January, 1954. Candidates selected for interview will be notified by 23rd January, 1954.

EPSOM, SURREY. WEST PARK HOSPITAL (for all stages of nervous and mental disorders). WEST PARK HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for 3 appointments of REGISTRAR in Psychiatry at above Hospital. Candidates may be of either sex. A house on the Hospital estate or single residential quarters are available.

Applications (5 copies), should be made on forms to be obtained from the Secretary to the Hospital Management Committee at the Hospital, to whom they should be returned within 14 days of the appearance of this advertisement.

EXETER. ROYAL DEVON AND EXETER HOSPITAL. EXETER AND MID-DEVON HOSPITALS MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners (Male and Female) for the appointment of HOUSE PHYSICIAN (medical and pædiatrics), vacant 25th February, 1954. The post is for a period of 6 months.

Applications, with copies of 2 recent testimonials, to be forwarded to the Hospital Secretary by 16th January, 1954.

EDINBURGH (near). ROSSLYNLEE HOSPITAL, ROSSLYN CASTLE, MIDLOTHIAN. HOUSE OFFICER, SENIOR HOUSE OFFICER or JUNIOR HOSPITAL MEDICAL OFFICER. Applications are invited for the above psychiatric posts. This Hospital of 400 Beds is 10 miles from Edinburgh and offers good training and experience in all modern methods of psychiatric treatment. Accommodation available for single officer—male or female.

Applications, with names of 2 referees, to the Physician-Superintendent.

FARNBOROUGH HOSPITAL, Farnborough, Kent. (800 Beds.) ORTHOPÆDIC SENIOR HOUSE OFFICER required immediately for 6 months. Salary £670 p.a., less £150 for residence.

Apply, stating age, qualifications with dates, experience, and naming 3 referees, to the Administrative Officer.

FOLKESTONE. ROYAL VICTORIA HOSPITAL. Applications are invited for the appointment of SENIOR HOUSE SURGEON at the above Hospital. Applicants should have held at least 3 hospital posts. The appointment will be tenable for a year. Salary £670 a year, less a deduction of £150 a year for residential emoluments.

Applications, stating age, qualifications, and the names and addresses of 2 referees, should be made to the Group Secretary, " Ash-Eton," Radnor Park West, Folkestone.

FOLKESTONE. ROYAL VICTORIA HOSPITAL. Applications are invited for the appointment of HOUSE SURGEON at the above Hospital which is recognised for Pre-registration Service. Salary £350, £400, or £450 a year according to experience, less a deduction of £100 a year for residential emoluments. This post is recognised by the Royal College of Surgeons for the F.R.C.S. examination.

Applications, stating age, qualifications, experience, and the names and addresses of 2 referees, to the Group Secretary, " Ash-Eton," Radnor Park West, Folkestone.

GUILDFORD. ST. LUKE'S HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER in the Radiotherapy Unit (54 Beds). Treatment of cancer by deep X ray, radium and surgery is carried out in the Unit. The post, which falls vacant on 19th January, 1954, provides excellent experience for a postgraduate working for a higher degree.

Applications, with full details, together with copies of recent testimonials, to the Physician-Superintendent as soon as possible.

GREENOCK. RAVENSCRAIG (MENTAL AND GENERAL) HOSPITAL. RENFREWSHIRE MENTAL HOSPITALS BOARD. Applications are invited for a whole-time appointment as SENIOR HOUSE OFFICER (resident) at above Hospital. Mental and general experience to be gained. Salary and conditions of service in accordance with National Health Service regulations.

Applications, in writing, should be sent to the Physician-Superintendent as soon as possible.

GREAT YARMOUTH AND GORLESTON GENERAL HOSPITAL, GREAT YARMOUTH. 2 HOUSE SURGEONS (Male or Female) required. The Hospital is staffed by a Consultant General Surgeon, and a Consultant E.N.T. Surgeon, and is regularly visited by Consultant staff from the Norfolk and Norwich Hospital. Recognised pre-registration posts. Salary in each case £350, £400, or £450 according to experience, less £100 for residence. Alternatively, as Senior House Officer posts, salary of £670, less £150 for residence.

Applications, stating age, qualifications, and experience, with names of 2 referees, to Hospital Secretary.

GRIMSBY GENERAL HOSPITAL. (226 Beds.) Sheffield REGIONAL HOSPITAL BOARD. Whole-time RESIDENT MEDICAL REGISTRAR required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 18th January, 1954, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

HALIFAX. ROYAL HALIFAX INFIRMARY. (301 Beds.) SENIOR HOUSE OFFICER in Orthopædic Surgery required at the above acute General Hospital. Duties include work in the Casualty Department. Post, recognised for F.R.C.S., vacant early January. Salary £670 p.a., with deduction of £130 p.a. for residence, &c.

Applications to Group Secretary, Royal Halifax Infirmary Halifax.

HASTINGS. ST. HELEN'S HOSPITAL. (491 Beds.) HOUSE SURGEON required. Resident. Male or Female. Pre-registration post, vacant 15th February. National scale of salary.

Apply to Hospital Administrator.

HASTINGS. ROYAL EAST SUSSEX HOSPITAL. (150 Beds.) HOUSE SURGEON required. Resident, Male or Female. Post vacant now. National scale of salary.

Apply to Hospital Administrator.

HAILSHAM, SUSSEX. HELLINGLY MENTAL HOSPITAL. HAILSHAM HOSPITAL MANAGEMENT COMMITTEE. JUNIOR HOSPITAL MEDICAL OFFICER. Single residential accommodation available. Salary £700 p.a., rising by annual increments of £50 to £1000 p.a.

Applications, stating age, qualifications and appointments held, to the Medical Superintendent, Hellingly Hospital, Hailsham, Sussex.

HAVERFORDWEST. PEMBROKE COUNTY WAR MEMORIAL HOSPITAL. (151 Beds—Recognised by the Royal College of Surgeons and for Pre-registration Service.) Applications are invited for the post of RESIDENT HOUSE OFFICER (surgical). Salary £350, £400, or £450 p.a., plus grant of £50 p.a., according to experience, less £100 p.a. for residential emoluments.

Applications, stating age, qualifications, experience, and nationality, with names and addresses of 3 referees, to Group Secretary, West Wales Hospital Management Committee, Glangwili, Carmarthen.

HEMEL HEMPSTEAD, HERTS. WEST HERTS HOSPITAL. Pre-registration HOUSE SURGEON. Post vacant 12th February, 1954.

Apply quoting 2 referees to the Hospital Secretary.

HEMEL HEMPSTEAD, HERTS. WEST HERTS HOSPITAL. Pre-registration HOUSE PHYSICIAN. Post vacant 28th January, 1954.

Apply, quoting 2 referees, to the Hospital Secretary.

HERTFORD COUNTY HOSPITAL. (171 Beds. Hospital situated 21 miles from London.) CASUALTY OFFICER (Male or Female), third post held, with attachment to Pædiatrician and Ophthalmic Consultant. Salary £450 p.a., less £100 p.a. residential emoluments. Appointment to commence as soon as possible.

Apply, with full details and references, to Secretary, Hertford County Hospital, Hertford, Herts.

HOVE GENERAL HOSPITAL, Sackville-road, Hove, 3. HOUSE SURGEON AND CASUALTY OFFICER (recognised for F.R.C.S.). Post vacant immediately. Salary and conditions of service in accordance with national scale (£350–£450, less £100 p.a. for residential emoluments).

Applications, stating age, qualifications, experience, and naming 2 referees, to the Administrative Officer.

HORNCHURCH. ST. GEORGE'S HOSPITAL. Applications are invited from registered medical practitioners for the post of JUNIOR HOSPITAL MEDICAL OFFICER (resident) at the above Hospital which accommodates 339 chronic sick patients. The post offers excellent geriatric experience. Salary £700–£50–£1000 p.a., less £150 p.a. for board and accommodation.

Applications, stating age, nationality, qualifications, present appointment and experience, with copies of 2 testimonials of recent date or names of referees, should be sent immediately to the Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

HUDDERSFIELD HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from provisionally registered or registered medical practitioners for the post of HOUSE SURGEON to the Princess Royal Maternity Home (57 Beds) to commence duty on 3rd February, 1954. The holder of the post, which is recognised for the D.Obst.R.C.O.G., will have access to the abnormal maternity and gynæcological beds at the Royal Infirmary. The Department is under the control of 2 Consultant Obstetricians and Gynæcologists. Salary in accordance with national scale.

Applications to be addressed to—

H. J. JOHNSON, Secretary to the Management Committee.

Royal Infirmary, Huddersfield.

HULL. VICTORIA HOSPITAL FOR SICK CHILDREN, Park-street. HULL A GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for :—

2 HOUSE SURGEON posts, now vacant.

1 HOUSE PHYSICIAN post, vacant March.

6-monthly term in each case. All count toward D.C.H. qualification.

Replies, with testimonials, to be sent to the Hospital Secretary.

IPSWICH. EAST SUFFOLK AND IPSWICH HOSPITAL. (360 Beds.) Applications are invited for the post of HOUSE SURGEON to the E.N.T. and Ophthalmic Departments. Post recognised for D.L.O. examination.

Applications, stating age, nationality, experience and copies of recent testimonials, to the Hospital Secretary.

IPSWICH. EAST SUFFOLK AND IPSWICH HOSPITAL. (360 Beds.) EAST ANGLIAN REGIONAL HOSPITAL BOARD. RADIOLOGICAL REGISTRAR. The department is the centre for Consultant Radiological Services for the Ipswich Hospital Group. Appointment for 1 year, renewable for second year.

Detailed applications, including age and names of 3 referees, to Secretary of Board, 117, Chesterton-road, Cambridge, by 25th January, 1954. Candidates invited to visit Hospital by direct arrangement with Hospital Management Committee Secretary at the Hospital.

ILFORD, ESSEX. KING GEORGE HOSPITAL. There will be vacancies for the following pre-registration posts at the above Hospital.

* HOUSE SURGEON—1st February, 1954.
† HOUSE SURGEON—13th February, 1954.
* HOUSE SURGEON—18th February, 1954.
* HOUSE PHYSICIAN—1st February, 1954.

* First or second post.
† Second post.

Applications, giving full particulars and accompanied by testimonials, should be sent to the undersigned within 7 days of the appearance of this advertisement.

H. F. HARRIS, Deputy Secretary,

Ilford and Barking Group Hospital Management Committee.

King George Hospital, Ilford.

KEIGHLEY AND DISTRICT VICTORIA HOSPITAL, KEIGHLEY, YORKSHIRE. (144 Beds.) 2 RESIDENT HOUSE SURGEONS (either sex) (general surgery, gynæcology, and E.N.T.); (general surgery, orthopædics, and E.N.T.). First, second, or third posts, vacant now. Approved pre-registration appointments. Tenable for 6 months. Practitioners registered before 1st January, 1953, may also apply.

Applications, with full particulars, and copies of testimonials, to be sent to Group Secretary, St. John's Hospital, Fell-lane, Keighley.

KINGSTON HOSPITAL, Wolverton-avenue, Kingston UPON THAMES. KINGSTON GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from suitably qualified medical practitioners for the position of SENIOR HOUSE OFFICER (Orthopædic and Casualty Department), resident or non-resident. The post becomes vacant 1st March, 1954, and is recognised for F.R.C.S.

Applications by letter stating age, qualifications and experience, with copies of not more than 2 recent testimonials or names of referees, should reach the Physician-Superintendent of the Hospital as soon as possible.

KIDDERMINSTER AND DISTRICT GENERAL HOSPITAL. (111 Beds.) HOUSE SURGEON required at the above Hospital. Post falls vacant on 28th January, 1954.

Applications, with the names of 3 referees, to the Hospital Secretary.

LANCASTER MOOR HOSPITAL, Lancaster. (Regional Mental Hospital.) Applications invited for post of RESIDENT or NON-RESIDENT JUNIOR HOSPITAL MEDICAL OFFICER (Male or Female). Preference to candidates who have held house appointments at general hospitals. Unfurnished flat or house in Hospital grounds available for married applicants if required; furnished quarters for single persons. Modern methods of investigation and treatment carried out. Outpatient clinics (3) staffed from Hospital.

Applications, stating age, qualifications, and experience, and names of 2 referees, to be sent to the Medical Superintendent.

LANCASTER MOOR HOSPITAL, Lancaster. (Regional Mental Hospital.) Applications invited for post of RESIDENT SENIOR HOUSE OFFICER (Female preferred). Furnished quarters available. Preference to candidates who have held house appointments at general hospitals. Full clinical facilities for study for D.P.M. Outpatient clinics staffed from Hospital.

Applications, stating age, qualifications, and experience, with names of 2 referees, to be sent to the Medical Superintendent.

LANCASTER. ROYAL LANCASTER INFIRMARY. (230 Beds.) SENIOR HOUSE OFFICER (casualty). The successful applicant will work with the Specialist Orthopædic Unit. The post, recognised for F.R.C.S., is vacant early 1954 and normally tenable for 1 year.

Applications, with names of 2 referees, to be addressed to the Secretary, Royal Lancaster Infirmary, Lancaster.

LANCASTER. ROYAL LANCASTER INFIRMARY. (230 Beds.) RESIDENT HOUSE OFFICER (medical). Duties include care of acute cases under the supervision of 2 Consultant Physicians and attendance at Consultative Clinics. Post vacant February, 1954, and normally tenable for 6 months, and recognised as a pre-registration post.

Applications, with names of 2 referees, to be addressed to Secretary, Royal Lancaster Infirmary, Lancaster.

LANCASTER. ROYAL LANCASTER INFIRMARY (230 Beds.) RESIDENT SENIOR HOUSE OFFICER (orthopædics). Post recognised for F.R.C.S. and the successful applicant will work with an Orthopædic and Traumatic Specialist Unit. Post vacant now and normally tenable for 1 year.

Applications, with names of 2 referees, to be addressed to Secretary, Royal Lancaster Infirmary, Lancaster.

LANCASTER. ROYAL LANCASTER INFIRMARY. (230 Beds.) RESIDENT HOUSE OFFICER (surgical). Successful applicant will work with Consultant Surgical Unit and attend Consultative Clinics. Post is vacant now and normally tenable for 6 months. Recognised as a pre-registration post.

Applications, with names of 2 referees, to be addressed to the Secretary, Royal Lancaster Infirmary, Lancaster.

LANCASTER. ROYAL LANCASTER INFIRMARY. (230 Beds.) RESIDENT SENIOR HOUSE OFFICER (surgical). The successful applicant will work with a Consultant Surgical Unit and attend at Consultative Clinics. The post, recognised for F.R.C.S., is vacant 1st February, 1954, and normally tenable for 12 months.

Applications, with names of 2 referees, to be addressed to the Secretary, Royal Lancaster Infirmary, Lancaster.

LEAMINGTON SPA. WARNEFORD GENERAL HOSPITAL. (207 Beds.) SOUTH WARWICKSHIRE HOSPITAL GROUP (NO. 14). HOUSE SURGEON (obstetrics and gynæcology), pre-registration post. Recognised for D.Obst.R.C.O.G.

Apply as soon as possible to the Hospital Secretary.

LEEDS. UNITED LEEDS HOSPITALS. The General INFIRMARY AT LEEDS. Applications are invited for the post of HOUSE SURGEON to the Department of Neurosurgery. The post is resident and is recognised for Pre-registration Service under the Medical Act, 1950.

Applications, stating age and qualifications, together with the names of 3 referees, should be forwarded to the undersigned as soon as possible.

S. CLAYTON FRYERS, Secretary to the Board.

General Infirmary, Leeds, 1.

LEEDS (near). MENSTON (MENTAL) HOSPITAL. Applications invited for whole-time appointment as JUNIOR HOSPITAL MEDICAL OFFICER. Facilities available for training in all branches of psychiatry in conjunction with University of Leeds, Department of Psychiatry. Salary in accordance with terms and conditions of service of hospital medical and dental staffs. Residential accommodation for single applicant.

Apply forthwith to Medical Superintendent, stating age, marital state, qualifications, experience and giving names and addresses of 2 referees.

LEEDS (near). SCALEBOR PARK HOSPITAL, Burley-IN-WHARFEDALE, near LEEDS. Applications are invited for the post of SENIOR HOUSE OFFICER (Male or Female) at Scalebor Park, a modern hospital of 323 Beds for the active treatment of nervous and mental disorders. The Hospital is associated for teaching purposes with the Department of Psychiatry of Leeds University and facilities will be granted for attending the D.P.M. course. The salary is £670 p.a., less £130 for full residential emoluments, or a house will be available for a married man if required, for which an agreed rental will be payable.

Applications to the Medical Superintendent immediately.

LEEDS, 9. ST. JAMES'S HOSPITAL. Leeds A Group HOSPITAL MANAGEMENT COMMITTEE. Locum SENIOR HOUSE OFFICER (psychiatry) required. £13 per week with a deduction for services provided.

Apply to the Group Secretary, St. James's Hospital, Leeds, 9.

LEEDS, 9. ST. JAMES'S HOSPITAL. Leeds A Group HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners (Male and Female) for the appointment of SENIOR HOUSE OFFICER (psychiatry). The department consists of emergency admission-wards and units for the treatment of early psychotic and neurotic cases. There is a large outpatient commitment. The Unit is recognised as affording suitable training for the D.P.M. examination and facilities will be provided for attendance at courses for this examination at Leeds University. The appointment will be for a period of 1 year and the salary will be in accordance with the agreed terms and conditions of service of hospital medical and dental staffs—namely, £670 p.a., with an appropriate deduction in respect of board, lodging, and other services provided.

Applications, stating age, qualifications, experience, &c., together with the names of 2 referees, to be forwarded to the undersigned as soon as possible.

J. FOLKARD, Secretary to the Committee.

Administrative Offices, St. James's Hospital, Leeds, 9.

LEEDS REGIONAL HOSPITAL BOARD invites applications for the following REGISTRAR posts :—

Anæsthetics

(*a*) Hull A Group with additional duties at hospitals in the Hull B and East Riding Groups (non-resident).

(*b*) Halifax Group (resident).

(*c*) Bradford A and B Groups (preferably resident).

General Medicine

East Riding Group (80 general medical beds) and Hull A Group (230 general medical beds). Duties 6/11ths or more East Riding and remainder Hull. Holder to reside in Beverley.

Infectious Diseases

Leeds Road Hospital, Bradford (120 I.D. beds) (resident).

Ophthalmology

St. James's Hospital (22 eye beds) and the Public Dispensary, Leeds (non-resident).

Orthopædic Surgery

Woodlands Orthopædic Hospital, Rawdon (100 Beds), and Orthopædic Outpatient Department, Bradford Royal Infirmary. Offers excellent training in all branches of accident and orthopædic Surgery (resident at Woodlands).

Psychiatry

(*a*) Oulton Hall Hospital, near Wakefield, and affiliated Mental Deficiency Colonies (aggregating 780 Beds) (non-resident).

(*b*) Meanwood Park (Mental Deficiency) Hospital, Leeds (700 Beds) (resident—flat available for married man without children).

(*c*) Storthes Hall Hospital, Kirkburton, near Huddersfield (2680 Beds), and associated clinics.

Facilities for attendance at the Leeds University will be provided if the successful candidates are studying for the D.P.M.

Applications, stating age, qualifications, and details of present and previous appointments with dates, together with the names and addresses of 3 referees, should be forwarded to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, not later than 22nd January, 1954.

LEICESTER (near). CARLTON HAYES MENTAL HOSPITAL, NARBOROUGH, LEICESTER. (Recognised for training for D.P.M.) LEICESTER NO. 4 HOSPITAL MANAGEMENT COMMITTEE. JUNIOR HOSPITAL MEDICAL OFFICER (psychiatry) required for above Hospital. Residential accommodation for single person (house may become available for married man).

Apply, giving age, qualifications, experience and names of 3 referees, to Medical Superintendent not later than 16th January, 1954.

LINCOLN. COUNTY HOSPITAL. (200 Beds. Recognised for training in Gynæcology for M.R.C.O.G.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT REGISTRAR (obstetrics and gynæcology) required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 18th January, 1954, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

LINCOLN. COUNTY HOSPITAL. (200 Beds.) Lincoln NO. 1 HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for an approved Pre-registration Post in Surgery at the above Hospital, vacant as from 16th February, 1954.

Apply with full particulars to—

R. W. HOWICK, Group Secretary.

LINCOLN. COUNTY HOSPITAL. (200 Beds.) Lincoln NO. 1 HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for an approved Pre-registration Post in Medicine at the above Hospital, vacant as from 1st February, 1954.

Apply with full particulars to—

R. W HOWICK Group Secretary.

LLANELLY HOSPITAL. (164 Beds.) Glantawe HosPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the locum appointment of JUNIOR HOSPITAL MEDICAL OFFICER at the above Hospital, for work in the Surgical Unit.

Applications, stating age, qualifications and experience, should be forwarded to—

O. C. HOWELLS, Group Secretary,
Glantawe Hospital Management Committee.
St. Helen's-road, Swansea.

LLANELLY HOSPITAL. (164 Beds.) Glantawe Hospital MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the resident post of SENIOR HOUSE OFFICER for work in the Surgical Unit of the above Hospital.

Full particulars, stating age, qualifications and experience, should be addressed to—

O. C. HOWELLS, Group Secretary,
Glantawe Hospital Management Committee.
St. Helen's-road, Swansea.

LLANELLY HOSPITAL. (164 Beds.) Glantawe Hospital MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the appointment of SENIOR HOUSE OFFICER for duty in the E.N.T., Ophthalmic and Gynæcological Departments.

Full particulars, stating age, qualifications and experience, should be addressed to the Group Secretary, Glantawe Hospital Management Committee, St. Helen's-road, Swansea.

O. C. HOWELLS, Group Secretary.

MACCLESFIELD HOSPITAL. Macclesfield and District HOSPITAL MANAGEMENT COMMITTEE. Vacancy : SENIOR HOUSE OFFICER in Medicine. Department has 56 acute beds together with some chronic sick ; excellent opportunities available for gaining valuable experience.

Apply immediately, with full particulars and copies of recent testimonials, to Group Secretary, " Willerby House," Cumberland-street, Macclesfield.

MACCLESFIELD HOSPITAL. Macclesfield and District HOSPITAL MANAGEMENT COMMITTEE. Applications invited for SENIOR HOUSE OFFICER ANÆSTHETIST. Main duties Infirmary Branch ; Hospital recognised F.F.A.R.C.S. purposes ; post may be considered non-resident with certain qualifications.

Apply immediately Group Secretary, " Willerby House," Cumberland-street, Macclesfield.

MALVERN, WORCS. ST. WULSTAN'S HOSPITAL. RESIDENT MEDICAL OFFICER (Junior Hospital Medical Officer) required. The post offers good experience in modern treatment of pulmonary tuberculosis and in all forms of major and minor surgery. Some experience necessary, either surgical or medical. National Health Service conditions of service.

Applications to the Physician-Superintendent.

MAIDENHEAD HOSPITAL, St. Luke's-road, MaidenHEAD. RESIDENT SURGICAL REGISTRAR required at above Hospital. Hospital may be visited by direct appointment.

Application forms obtainable from and returnable to Group Secretary, Windsor Group Hospital Management Committee, Alma-road, Windsor, by 23rd January, 1954.

MAIDENHEAD HOSPITAL, St. Luke's-road, MaidenHEAD. Applications are invited for post of HOUSE SURGEON vacant 9th February, 1954. Preference given to persons seeking pre-registration post under the Medical Act, 1950. National salary.

Applications, stating age, nationality, and qualifications, together with names of 3 referees, to Hospital Secretary.

MANCHESTER. UNITED MANCHESTER HOSPITALS. SAINT MARY'S HOSPITALS, MANCHESTER. Applications are invited from registered medical practitioners (Male or Female) for the 2 posts of HOUSE PHYSICIAN in the Neonatal Unit of Saint Mary's Hospitals (attached to the University Department of Child Health) for a period of 6 months vacant on 1st and 8th March, 1954. Previous hospital experience essential and pædiatric experience desirable. Duties include the care of newborn in the Maternity Department, the care of infants in the infants' ward and work in the clinics under the charge of the Department of Child Health. Salary in accordance with national scale.

Applications, stating qualifications and experience, together with the names of 3 referees, should be sent to the undersigned within 10 days of the appearance of this notice.

A. R. WISE, General Superintendent.

Saint Mary's Hospitals, Whitworth Park, Manchester, 13.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL INFIRMARY, MANCHESTER, 13. 2 Trainee DIAGNOSTIC RADIOLOGISTS, to commence on 1st March, 1954. Whole-time non-resident posts tenable for 24 months at a salary of £670 p.a. Applicants must be prepared to devote their whole time to the hospital service, but facilities will be granted for attendance at the University course of instruction for the D.M.R.(D.), which the successful applicants must be prepared to take. This course starts on 1st March, 1954, and particulars may be obtained from the Postgraduate Dean, Medical School, University of Manchester. Applicants must fulfil the requirements of the Examining Board in England, 8–11, Queen-square, London, W.C.1, for the D.M.R.(D.) and must submit written evidence to that effect with their applications.

Applications to be made on forms obtainable from the undersigned and to be returned not later than 18th January, 1954.

G. H. TAYLOR, Secretary.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL INFIRMARY, MANCHESTER, 13. SENIOR HOUSE OFFICER to a General Medical Unit, to commence as soon as possible. Whole-time non-resident post, tenable for 6 months, renewable for a second and possibly a third 6 months.

Applications to be made on forms obtainable from the undersigned and to be returned not later than 20th January, 1954.

G. H. TAYLOR, Secretary.

MANCHESTER ROYAL EYE HOSPITAL. United MANCHESTER HOSPITALS. Applications are invited for SENIOR HOUSE OFFICER post. Salary £670 p.a., less £130 p.a. for residential emoluments.

Application forms may be obtained from H. R. NORTH, General Superintendent.

MANCHESTER. WEST MANCHESTER HOSPITAL MANAGEMENT COMMITTEE.

Park Hospital, Davyhulme (General Hospital—426 Beds)

1 SENIOR HOUSE OFFICER (anæsthetics). Hospital recognised for training for Diploma in Anæsthetics. Post now vacant.

1 HOUSE OFFICER (E.N.T.) (pre-registration). Post now vacant.

Eccles and Patricroft Hospital (General Hospital—72 Beds)

1 HOUSE OFFICER (post-registration post). Additional allowance of £50 p.a., Post now vacant. The work of the Hospital is mainly surgical and there is a busy Outpatient Department.

Forms from Secretary, Park Hospital, Davyhulme.

MANCHESTER REGIONAL HOSPITAL BOARD. Birch HILL HOSPITAL. SURGICAL REGISTRAR required end January, 1954. Accommodation for married man available. Post recognised for 6 months of F.R.C.S. qualification. Tenable for 1 year in first instance.

Apply to Group Secretary, Central Offices, Birch Hill Hospital, Rochdale, Lancs, with names of 2 referees immediately.

MANCHESTER REGIONAL HOSPITAL BOARD. Applications are invited for the post of REGISTRAR in Chest Diseases to the Bury and Rossendale Hospital Management Committee.

Apply, giving names of 2 referees, to—
H. WILKINSON, Group Secretary.

Bury General Hospital, Bury, Lancs.

MANCHESTER REGIONAL HOSPITAL BOARD. ROCHDALE INFIRMARY. SURGICAL REGISTRAR (resident) required early March, 1954. Post recognised for 6 months of F.R.C.S. qualification. Tenable for 1 year in the first instance.

Apply to Group Secretary, Central Offices, Birch Hill Hospital, Rochdale, Lancs, with names of 2 referees within 14 days of the publication of this notice.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the post of REGISTRAR in Pathology in the Wigan and Leigh Hospital Management Committee Group Laboratory established at the Royal Albert Edward Infirmary, Wigan. The Laboratory is well equipped and recognised for the D.Path. There are excellent opportunities for gaining extensive experience in all branches of pathology.

Applications, stating age, nationality, qualifications, together with copies of 2 recent testimonials or names of referees, should be sent to the Secretary, Wigan and Leigh Hospital Management Committee, Knowsley House, Wigan, by 31st January, 1954.

MANCHESTER REGIONAL HOSPITAL BOARD. REGISTRAR in Anæsthetics to the Bolton and District Group of hospitals, with main duties at Bolton Royal Infirmary and Bolton District General Hospital. Recognised for the D.A. and F.F.A.R.C.S.

Applications, stating age, nationality, qualifications, experience, and the names of 2 referees, should be sent immediately to the undersigned at the Royal Infirmary, Bolton.

H. P. TRAVIS, Group Secretary,
Bolton and District Hospital Management Committee.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the post of NON-RESIDENT SENIOR REGISTRAR in Radiotherapy at the Christie Hospital and Holt Radium Institute, Manchester. D.M.R. (T.) essential and a higher qualification, together with training in medicine and surgery prior to specialisation will be an advantage.

Forms of application may be obtained from the Senior Administrative Medical Officer of the Board, Cheetwood-road, Manchester, 8, and should be returned, with the names of 3 referees, by 18th January, 1954.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the post of RESIDENT REGISTRAR in the Board's Non-tuberculous Thoracic Surgery Unit of 48 Beds at Park Hospital, Davyhulme. 1-year appointment, renewable. Post now vacant.

Application forms from Secretary, West Manchester Hospital Management Committee, Park Hospital, Davyhulme, Urmston.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the post of Whole-time RESIDENT SURGICAL REGISTRAR to the West Manchester Hospital Management Committee. Primarily for duty at Park Hospital, Davyhulme, but with duties at other Group hospitals. Post now vacant. 12 months appointment, subject to renewal.

Forms from Secretary, Park Hospital, Davyhulme.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the post of REGISTRAR in Thoracic Surgery to the Blackpool and Fylde Group of hospitals, with main duties at Victoria Hospital, Blackpool.

Applications, together with copies of 2 recent testimonials, should be sent to the Group Secretary, Blackpool and Fylde Hospital Management Committee, Victoria Hospital, Blackpool.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the post of NON-RESIDENT REGISTRAR in Chest Diseases. The main duties will be with the Stockport and Buxton Hospital Management Committee, and the successful candidate will work under the direction of the Consultant Chest Physician. The post offers scope for experience in both tuberculous and non-tuberculous diseases of the chest, and in hospital, sanatorium and clinic practice.

Applications, stating age, qualifications and experience, together with the names of 2 referees to be addressed to the undersigned, immediately. H. G. PRICE, Group Secretary.

59B, Shaw-heath, Stockport, Cheshire.

MARKET DRAYTON (near), SALOP. CHESHIRE JOINT SANATORIUM. (305 Beds.) STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. RESIDENT MEDICAL OFFICER (Junior Hospital Medical Officer or Senior House Officer, according to experience). Post offers exceptional experience in the treatment of pulmonary tuberculosis.

Applications to the Medical Superintendent at the Sanatorium.

NEWMARKET GENERAL HOSPITAL, Newmarket, SUFFOLK. Applications are invited for the post of HOUSE SURGEON (duties to commence 27th January, 1954). Duties include surgical house charge of general surgical, E.N.T. and eye cases. The post is resident and available for 6 months, and is recognised for pre-registration.

Applications, with copies of 3 recent testimonials, should be addressed to the Physician-Superintendent.

MAIDSTONE. WEST KENT GENERAL HOSPITAL. (135 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of RECEIVING-ROOM OFFICER. Post vacant February, 1954. Salary £670 a year, with deduction of £150 a year for residential emoluments.

Applications to Administrative Officer at Hospital as soon as possible.

MAIDSTONE. PRESTON HALL HOSPITAL, British LEGION VILLAGE, MAIDSTONE, KENT. Applications are invited for the appointment of SENIOR HOUSE OFFICER. Salary £670 p.a., national scale and conditions. The Sanatorium contains 330 Beds for the treatment of tuberculosis and includes a Major Thoracic Surgical Unit.

Applications, stating age, qualifications, and names of 2 referees, to be sent not later than 31st January, 1954, to—

A. A. HOWICK,
Secretary to the Management Committee.

NEWPORT, MON. ROYAL GWENT HOSPITAL. (260 Beds—9 Residents,) JUNIOR HOSPITAL MEDICAL OFFICER (E.N.T. and ophthalmic) required. Post recognised for D.L.O. There are 23 E.N.T. and 8 ophthalmic beds. Salary £700–£50–£1000, less £120 for board-residence.

Write, quoting 2 referees, to T. A. JONES,
64, Cardiff-road, Newport, Mon.

NEWTON ABBOT HOSPITAL. (General Section—65 Beds.) RESIDENT SENIOR HOUSE SURGEON (Male or Female) required immediately. Married quarters available.

Applications, stating qualifications, nationality, age, with copy testimonials, to be sent to the Group Secretary, Torquay District Hospital Management Committee, 62/64, East-street, Newton Abbot, S. Devon.

NEWCASTLE REGIONAL HOSPITAL BOARD. South SHIELDS DISTRICT HOSPITAL MANAGEMENT COMMITTEE. REGISTRAR GENERAL SURGEON (whole-time) at South Shields General Hospital (625 Beds). Salary £775–£890 p.a. Single or married accommodation available. Appointment for 1 year in the first instance and may be renewed for a further period. Post recognised for F.R.C.S.

Applications, together with names and addresses of referees (preferably), or testimonials, to a total of 3, to be sent to the Senior Administrative Medical Officer, "Blythswood South," Osborne-road, Newcastle upon Tyne, 2, within 7 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. South WEST DURHAM HOSPITAL MANAGEMENT COMMITTEE. REGISTRAR (general surgery), whole-time, Bishop Auckland General Hospital (300 Beds, including 72 general surgical beds). Single accommodation available; married accommodation might be arranged. Salary scale £775–£890 p.a. Appointment for 1 year in the first instance.

Applications, together with names and addresses of referees (preferably), or testimonials, to a total of 3, to be sent to the Senior Administrative Medical Officer, "Blythswood South," Osborne-road, Newcastle upon Tyne, 2, within 14 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. St. GEORGE'S HOSPITAL, MORPETH. (1170 Beds.) SENIOR PSYCHIATRIC REGISTRAR (resident), whole-time. Salary scale £1000–£1300. Candidates should normally have had previous experience in psychiatry, but applications will be considered from candidates with no previous practical experience in psychiatry who hold a higher medical qualification, have had wide experience in general medicine, and intend to obtain a Diploma in Psychological Medicine and specialise in psychiatry. Arrangements can be made for the person appointed to take the necessary course of study for the Durham Diploma in Psychological Medicine. A small 3-roomed, furnished or unfurnished flat in Hospital is available. The appointment is for 1 year, in the first instance, and may be renewed from year to year for 4 years. Candidates are free to visit the Hospital by arrangement with the Medical Superintendent, from whom further particulars may be obtained.

Applications, together with names and addresses of referees (preferably), or testimonials, to a total of 3, to be sent to the Regional Psychiatrist, "Blythswood South," Osborne-road, Newcastle upon Tyne, 2, within 14 days.

NORTHWOOD, MIDDLESEX. MOUNT VERNON HOSPITAL. Applications are invited for the post of HOUSE SURGEON to the Gynæcological Department of 25 Beds. This appointment is recognised for the M.R.C.O.G.

Applications, accompanied by 2 testimonials, should be forwarded to the Resident Medical Officer, Mount Vernon Hospital, Northwood, Middlesex, by 25th January, 1954.

NORTHWOOD, MIDDLESEX. MOUNT VERNON HOSPITAL. Applications are invited for the post of HOUSE PHYSICIAN for general medicine and dermatology. This post is recognised as a pre-registration appointment.

Applications, accompanied by 2 testimonials, should be forwarded to the Resident Medical Officer, Mount Vernon Hospital, Northwood, Middlesex, by 25th January, 1954.

NORTHWOOD, MIDDLESEX. MOUNT VERNON HOSPITAL. Applications are invited for the post of HOUSE PHYSICIAN to the Radiotherapy Department. This post is recognised as a pre-registration appointment.

Applications, accompanied by 2 testimonials, should be forwarded to the Resident Medical Officer, Mount Vernon Hospital, Northwood, Middlesex, by 25th January, 1954.

NORTHWOOD, MIDDLESEX. MOUNT VERNON HOSPITAL. Applications are invited for the post of HOUSE SURGEON for General Surgery and Orthopædic Surgery. Recognised for the Final F.R.C.S. in general surgery, and recognised as a pre-registration appointment.

Applications, accompanied by 2 testimonials, to be forwarded to the Resident Medical Officer, Mount Vernon Hospital, Northwood, Middlesex, by 20th January, 1954.

NOTTINGHAM GENERAL HOSPITAL. Applications are invited from registered medical practitioners for the post of SENIOR ORTHOPÆDIC AND FRACTURE HOUSE OFFICER. The post offers exceptional experience in traumatic and orthopædic surgery. Duties to commence as soon as possible. Salary and conditions of service in accordance with Ministry regulations. If resident £150 deducted for emoluments.

Applications, stating age, qualifications, and experience, together with copies of testimonials, to be sent to—

HENRY M. STANLEY, Secretary.

NOTTINGHAM GENERAL HOSPITAL. Ear, Nose, AND THROAT DEPARTMENT. Applications are invited for the post of SENIOR E.N.T. HOUSE OFFICER at the above Hospital. This appointment is recognised for the D.L.O. and the F.R.C.S. examinations. Terms and conditions of service in accordance with the regulations of the Ministry of Health. Duties to commence about the end of January. Although the post is normally resident, consideration will be given to any applicant who desires to live out.

Applications, stating age, qualifications, and experience, together with copies of testimonials, to be sent to—

HENRY M. STANLEY, Group Secretary.

General Hospital, Nottingham.

NOTTINGHAM GENERAL HOSPITAL. Resident HOUSE SURGEON required (Male or Female) for the above Hospital. Duties to commence on or about 21st January, 1954. Salary and conditions of service in accordance with published regulations. The appointment is for a period of 6 months.

Applications, stating age, qualifications and experience, to be sent to HENRY M. STANLEY, Group Secretary.

NOTTINGHAM. HIGHBURY HOSPITAL. House PHYSICIAN (non-resident) required. The successful candidate will in addition to medical duties have an opportunity of assisting in the Obstetric Unit. Terms and conditions of service as laid down by the Ministry of Health. This post will be accepted as a general medical appointment for entry to the M.R.C.O.G. examination.

Apply in writing, stating age, qualifications and experience, together with copies of testimonials, to the undersigned as soon as possible. H. M. STANLEY, Secretary.

NOTTINGHAM CITY HOSPITAL. (823 Beds.) Applications are invited for the post of HOUSE SURGEON, vacant 12th February, 1954. Recognised for pre-registration purposes.

Applications, stating age, nationality, qualifications, and experience, together with copies of not more than 3 testimonials, to be sent immediately to the Hospital Secretary, City Hospital, Hucknall-road, Nottingham.

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Whole-time TUBERCULOSIS REGISTRAR required at St. Albans Chest Clinic, St. Albans City Hospital, St. Albans, Herts. Duties will include work in the Chest Clinic, on the tuberculosis wards, and at a nearby mass Radiography Unit. Good training in general medicine essential and special experience in chest diseases desirable. Clinic may be visited by direct appointment.

Application forms obtainable from, and returnable to, Group Secretary, Mid-Herts Group Hospital Management Committee, St. Albans City Hospital, Normandy-road, St. Albans, by 18th January.

ORPINGTON HOSPITAL, Orpington, Kent. Resident SENIOR HOUSE PHYSICIAN (Tuberculosis Unit, 60 Beds —30 male and 30 female). Affords good clinical experience in the diagnosis and treatment of acute and chronic pulmonary tuberculosis. Offers excellent opportunity for studying for higher qualifications, with access to clinical material in the general medical and surgical wards of the Hospital. Ex-patient medical officer would be favourably considered.

Apply Physician-Superintendent.

OXFORD. UNITED OXFORD HOSPITALS. Applications are invited for locum post of FIRST ASSISTANT to the Department of Otolaryngology, Radcliffe Infirmary, with effect from the middle of February, 1954, for 6 months. The post is of Senior Registrar status and the holder must possess the Fellowship of 1 of the Royal College of Surgeons or the Mastership of a University in the specialty.

Applications, stating age, qualifications and experience, together with the names of 2 referees, to Administrator, Radcliffe Infirmary, Oxford.

OXFORD. UNITED OXFORD HOSPITALS. Applications invited for the post of RESIDENT MEDICAL OFFICER at the Osler Pavilion, Headington, for 6 months with effect from 1st February, 1954. Salary £670 p.a., less £100 p.a. for residence.

Applications, stating age, qualifications and experience, to Administrator, Radcliffe Infirmary, Oxford.

OXFORD REGIONAL HOSPITAL BOARD. Applications are invited for the whole-time non-resident post of REGISTRAR in E.N.T. Surgery to the hospitals of the Aylesbury/High Wycombe area. The appointment will be for 1 year and eligible for extension to a second year.

Applications on forms obtainable from the Secretary, Registrar Committee, 43, Banbury-road, Oxford, should reach him by 22nd January, 1954.

PONTYPRIDD (near). EAST GLAMORGAN HOSPITAL, CHURCH VILLAGE. (316 Beds and large Outpatient Department. Committee's Base Hospital serving population of 177,000. Recognised for D.Obst.R.C.O.G., D.C.H., and D.A.) PONTYPRIDD AND RHONDDA HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (anæsthetics), to commence in February, 1954.

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, to be sent to the Group Secretary, Pontypridd and Rhondda Hospital Management Committee, Courthouse-street, Pontypridd.

PONTYPRIDD (near). EAST GLAMORGAN HOSPITAL, CHURCH VILLAGE. (316 Beds. Committee's Base Hospital serving population of 177,000.) PONTYPRIDD AND RHONDDA HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (psychiatry). The post will offer experience and training in adult and child psychiatry and in psychosomatic medicine. Opportunities will be available for learning methods of clinical research and for study for the D.P.M. examination. Any further particulars will be furnished on request.

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, to be sent as soon as possible to the Group Secretary, Pontypridd and Rhondda Hospital Management Committee, Courthouse-street, Pontypridd.

PONTYPRIDD (near). EAST GLAMORGAN HOSPITAL, CHURCH VILLAGE. (316 Beds and large Outpatient Department—75 adult medical beds with Registrar, Senior House Officer and 2 Intern House Physicians. Committee's Base Hospital serving population of 177,000. Recognised for D.Obst. R.C.O.G., D.C.H., and D.A.) PONTYPRIDD AND RHONDDA HOSPITAL MANAGEMENT COMMITTEE. 2 SENIOR HOUSE OFFICERS (medical), 1 to commence immediately and to perform duties at other hospitals in the Group, as required. The other to commence on 1st February, 1954.

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, to be sent to the Group Secretary, Pontypridd and Rhondda Hospital Management Committee, Courthouse-street, Pontypridd.

PONTYPRIDD (near). EAST GLAMORGAN HOSPITAL, CHURCH VILLAGE. (316 Beds and large Outpatient Department. Committee's Base Hospital serving population of 177,000. Recognised for D.Obst.R.C.O.G., D.C.H., and D.A.) PONTYPRIDD AND RHONDDA HOSPITAL MANAGEMENT COMMITTEE. HOUSE OFFICER (obstetrics), to commence 1st February, 1954.

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, to be sent as soon as possible to the Group Secretary, Pontypridd and Rhondda Hospital Management Committee, Courthouse-street, Pontypridd.

PONTYPRIDD (near). EAST GLAMORGAN HOSPITAL, CHURCH VILLAGE. (316 Beds and large Outpatient Department. Committee's Base Hospital serving population of 177,000. Recognised for D.Obst.R.C.O.G., D.C.H., and D.A.) PONTYPRIDD AND RHONDDA HOSPITAL MANAGEMENT COMMITTEE. 4 HOUSE OFFICERS (surgical), to commence 1st February, 1954 (to include duties at the Porth and District Hospital).

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, to be sent as soon as possible to the Group Secretary, Pontypridd and Rhondda Hospital Management Committee, Courthouse-street, Pontypridd.

PONTYPRIDD (near). EAST GLAMORGAN HOSPITAL, CHURCH VILLAGE. (316 Beds and large Outpatient Department. Committee's Base Hospital serving population of 177,000. Recognised for D.Obst.R.C.O.G., D.C.H., and D.A.) PONTYPRIDD AND RHONDDA HOSPITAL MANAGEMENT COMMITTEE. HOUSE OFFICER (pædiatrics), to commence 1st February, 1954.

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, to be sent as soon as possible to the Group Secretary, Pontypridd and Rhondda Hospital Management Committee, Courthouse-street, Pontypridd.

PONTYPRIDD (near). EAST GLAMORGAN HOSPITAL, CHURCH VILLAGE. (316 Beds and large Outpatient Department. Committee's Base Hospital serving population of 177,000. Recognised for D.Obst.R.C.O.G., D.C.H., and D.A.) PONTYPRIDD AND RHONDDA HOSPITAL MANAGEMENT COMMITTEE. 2 HOUSE OFFICERS (medical), to commence 1st February, 1954.

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, to be sent as soon as possible to the Group Secretary, Pontypridd and Rhondda Hospital Management Committee, Courthouse-street, Pontypridd.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following appointments :—

Saint Mary's Hospital
(74 acute medical beds)

SENIOR HOUSE PHYSICIAN, vacant 23rd February, 1954.

HOUSE PHYSICIANS, vacant 4th February, 1954, and 8th February, 1954. Pre-registration posts.
(107 surgical beds) Recognised for F.R.C.S.

SENIOR HOUSE OFFICER (Casualty and Orthopædic Departments), vacant 14th January, 1954.

HOUSE SURGEONS, vacant 20th January, 1954, and 2nd February, 1954. Pre-registration posts.
PÆDIATRIC DEPARTMENT (53 Beds)

HOUSE PHYSICIAN, vacant 26th January, 1954.

Royal Portsmouth Hospital

SENIOR HOUSE SURGEON (Orthopædic and Casualty Departments), vacant 15th February, 1954.
(70 surgical beds) Recognised for F.R.C.S.

HOUSE SURGEON, vacant 26th January, 1954. Pre-registration post.
PÆDIATRIC DEPARTMENT (15 Beds)

HOUSE PHYSICIAN, vacant 17th February, 1954.

Queen Alexandra Hospital
(40 acute medical beds)

SENIOR HOUSE PHYSICIAN, vacant now.
(124 surgical beds) Recognised for F.R.C.S.

HOUSE SURGEONS, vacant now and 26th January, 1954. Pre-registration posts.

Applications, stating age, experience, and qualifications, and names of 2 referees, should be submitted as soon as possible to—
35, Grove-road South, Southsea. E. H. HURST.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of E.N.T. REGISTRAR, vacant on 20th April, 1954. Duties will be mainly at the Portsmouth Eye and Ear Hospital and Queen Alexandra Hospital. Post recognised for F.R.C.S. and D.L.O.

Forms of application may be obtained from the Secretary, Portsmouth Group Hospital Management Committee, 35, Grove-road South, Southsea, which should be returned to him duly completed on or before 22nd January, 1954. Canvassing will disqualify. Candidates may visit the above hospitals by arrangement with the Secretary of the Group.

PONTEFRACT GENERAL INFIRMARY. House PHYSICIAN required for medical and pædiatric cases, vacant 1st February, 1954. Excellent experience. 4 residents. Salary £350. This is a recognised pre-registration post, and applications will be considered from newly qualified practitioners.

Applications to—

W. BOWRING, Secretary,
Pontefract and Castleford Hospital Management Committee.
Gt. Northern House, Salter-row, Pontefract, Yorks.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL. Applications are invited from registered medical practitioners for the appointments of :—

(1) HOUSE OFFICER in Obstetrics, Alexandra Maternity Home, Devonport, vacant 1st March, 1954.

(2) RESIDENT ANÆSTHETIST, Greenbank Road Hospital vacant immediately. Recognised for the D.A.

(3) HOUSE SURGEONS (2 posts), Greenbank Road Hospital, vacancies immediately, and 13th March, 1954. Recognised for the Fellowship of the Royal College of Surgeons.

Applications, stating age, nationality, qualifications, and experience, with the names of 3 referees, to be sent to the undersigned as soon as possible.

ARTHUR R. CASH, Group Secretary.
7, Nelson-gardens, Stoke, Plymouth.

PAISLEY AND DISTRICT HOSPITALS BOARD OF MANAGEMENT.

Royal Alexandra Infirmary, Paisley

(1) SENIOR HOUSE OFFICER (anæsthetics). This post is recognised for the D.A. examination and is tenable for 1 year. Applicants should be at least 2 years qualified. Salary £670 p.a. 2 recent testimonials to be submitted with application.

(2) HOUSE SURGEON for Orthopædic and Fracture Unit. Salary according to previous posts held. This post becomes vacant on 1st February, 1954.

Royal Alexandra Infirmary Annexe, Paisley

(3) JUNIOR HOSPITAL MEDICAL OFFICER required immediately.

Applications for the above posts should be addressed to the Group Medical Superintendent, Royal Alexandra Infirmary, Paisley.

PETERBOROUGH MEMORIAL HOSPITAL. East ANGLIAN REGIONAL HOSPITAL BOARD. SURGICAL REGISTRAR at above Hospital. The successful candidate will be required to share duties in Casualty Department. Post offers wide experience. Appointment for 1 year, renewable for second year.

Detailed applications, including age and names of 3 referees, to Secretary of Board, 117, Chesterton-road, Cambridge, by 25th January, 1954. Candidates invited to visit Hospital by direct arrangement with Hospital Management Committee Secretary at the Hospital.

PORTH AND DISTRICT HOSPITAL, Porth, Rhondda, (110 Beds visited regularly by consultants from the Cardiff Royal Infirmary.) PONTYPRIDD AND RHONDDA HOSPITAL MANAGEMENT COMMITTEE. JUNIOR HOSPITAL MEDICAL OFFICER (surgical).

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, to be sent as soon as possible to the Group Secretary, Pontypridd and Rhondda Hospital Management Committee, Courthouse-street, Pontypridd.

RAMSGATE. GENERAL HOSPITAL. (101 Beds). HOUSE SURGEON. Approved pre-registration post. Salary at the rate of £350–£450 p.a., according to experience, less £100 for residential emoluments.

Applications, with copies of testimonials, to Hospital Secretary.

READING AND DISTRICT HOSPITAL MANAGE-MENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (anæsthetics) vacant shortly, for duties at the Royal Berkshire Hospital, Reading.

Apply, with full particulars and copies of recent testimonials, to Group Secretary, 3, Craven-road, Reading.

READING, ROYAL BERKSHIRE (403 Beds) and BATTLE (343 Beds) HOSPITALS. Applications are invited for the posts of 2 RESIDENT HOUSE SURGEONS, Area Accident and Orthopædic Department, vacant 1st February and 1st March, 1954. Also casualty duties.

Apply stating age, nationality, qualifications with dates, present post, with copy of recent testimonial, to Secretary, Royal Berkshire Hospital.

READING. ROYAL BERKSHIRE HOSPITAL. (403 Beds.) Applications invited for the appointment of HOUSE SURGEON to E.N.T. Department, vacant immediately. Salary within range £350–£450 p.a., less £100 for board-residence, &c.

Apply, stating age, qualifications with dates, nationality, present post, with copy of 1 recent testimonial, to Secretary.

ROCHFORD, ESSEX. GENERAL HOSPITAL. (603 Beds.) Applications are invited for the post of RESIDENT SENIOR HOUSE OFFICER to work in the Chest Unit (72 Beds) at the General Hospital, Rochford, and Lancaster House Chest Clinic, Southend-on-Sea. Post vacant end January, 1954. Good experience in general medicine essential and previous experience in tuberculosis and diseases of the chest desirable. Salary £670 p.a.

Applications, stating age, &c., to be sent to the undersigned not later than 16th January, 1954.

J. C. FIELD, Secretary.
General Hospital, Rochford, Essex.

ROCHFORD. GENERAL HOSPITAL. (603 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER to the Geriatric and Psychiatric Units at the above Hospital. A wide range of facilities are available at the Hospital for the investigation, treatment and rehabilitation of acute and chronic cases.

Applications, stating age, &c., to be sent to the undersigned by 16th January, 1954. J. C. FIELD, Secretary.
General Hospital, Rochford, Essex.

ROCHFORD, ESSEX. GENERAL HOSPITAL. (603 Beds.) Applications are invited for RESIDENT HOUSE SURGEON (House Officer grade). Recognised for F.R.C.S. Pre-registration post. Vacant 1st February, 1954.

Applications, &c., to be forwarded to the undersigned by 23rd January, 1954. J. C. FIELD, Secretary.

RICHMOND, SURREY. ROYAL HOSPITAL. (121 Beds.) KINGSTON GROUP HOSPITAL MANAGEMENT COMMITTEE. RESIDENT HOUSE SURGEON. Post vacant 1st January, 1954. Tenable for 6 months. Recognised for pre-registration and F.R.C.S. examination.

Apply to the Administrative Officer, Royal Hospital, Richmond, Surrey.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER in Pathology in this large general hospital containing a well-equipped laboratory where excellent opportunities exist for gaining extensive experience.

Applications, stating age, nationality, qualifications with dates, and experience, together with copies of 2 recent testimonials or names of referees, should be sent immediately to the Group Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) Applications are invited from registered medical practitioners for the post of ORTHOPÆDIC HOUSE SURGEON (resident) in the Orthopædic and Accident Unit, vacant from 1st February, 1954. The service consists of 100 Beds equally divided between traumatic surgery and "cold" orthopædics. Post is recognised for Pre-registration Service and for F.R.C.S.

Applications, stating age, nationality, qualifications with dates, present appointment and experience, and 2 recent testimonials or names of 2 referees, should be forwarded immediately to the Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) Applications are invited for the post of RESIDENT SENIOR HOUSE OFFICER (anæsthetics) vacant immediately. Excellent opportunities exist at this Hospital, which is recognised for the D.A., for gaining tuition and experience in the administration of anæsthetics. The equipment is the most modern available.

Applications, stating age, nationality, qualifications with dates, present appointment and details of experience with names of 2 referees, should be sent immediately to the Secretary, Hospital Management Committee, Oldchurch Hospital, Romford.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) Applications are invited from registered medical practitioners for the appointment of HOUSE PHYSICIAN (resident). Post tenable for 6 months.

Applications, stating age, nationality, qualifications with dates, and experience, together with copies of 2 recent testimonials or names of 2 referees, should be sent immediately to the Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) RESIDENT HOUSE SURGEONS (3) are required in February, 1954, in the General Surgical Unit at the above Hospital. Recognised for F.R.C.S. 6 months appointments. This very active general surgical unit of approximately 100 Beds affords ample opportunity for candidate to obtain first-class tuition and experience.

Applications, stating age, nationality, qualifications with dates, and details of experience, together with copies of 2 recent testimonials or names of 2 referees, should be sent immediately to the Group Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER in the Department of Ophthalmology, vacant from 24th February, 1954.

Applications, stating age, qualifications, present appointment and experience with dates, together with copies of 2 testimonials of recent date or names of 2 referees, should be sent immediately to the Group Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

ROMFORD, ESSEX. RUSH GREEN HOSPITAL. (301 Beds.) Applications are invited from registered medical practitioners for the post of HOUSE PHYSICIAN (resident), vacant from 24th February, 1954, and tenable for 6 months. This Hospital provides for acute medical and surgical patients in addition to a limited number of fever cases. The post offers good opportunities for gaining experience in both general medicine and fevers.

Applications, stating age, nationality, qualifications, present appointment and experience, with copies of 2 recent testimonials or names of referees, should be sent immediately to the Medical Superintendent.

ROTHERHAM HOSPITAL, Doncaster Gate, Rotherham. (155 Beds.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT SURGICAL REGISTRAR required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 18th January, 1954, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

RYDE, I.W. ROYAL I.W. COUNTY HOSPITAL. (116 Beds.) ISLE OF WIGHT GROUP HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON. Post approved for Pre-registration Service and recognised for F.R.C.S. National salary scale and conditions. Vacant 9th February, 1954.

Applications, stating age, nationality, qualifications and experience, together with the names of 2 referees, to be sent as soon as possible to Group Secretary, Hospital Management Committee Headquarters, Clatterford House, Carisbrooke, I.W.

SALISBURY GENERAL HOSPITAL. Salisbury Group HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT CASUALTY OFFICER (Senior House Officer) for a period of 12 months from 1st January, 1954.

Applications, naming 2 referees, to Group Secretary, Odstock Hospital, Salisbury.

SCUNTHORPE AND DISTRICT WAR MEMORIAL HOSPITAL. (269 Beds. Recognised for training for F.R.C.S.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT SURGICAL REGISTRAR required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 18th January, 1954, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

SCOTLAND. NORTHERN REGIONAL HOSPITAL BOARD invite applications for a post of SENIOR HOUSE OFFICER under the Joint Training Scheme in Hospital and General Practice, in which the Board and the Executive Council for the County of Inverness are associated. The scheme provides a combined training of 2 years duration for young medical practitioners intending to enter medical practice or a specialty. Concurrent experience in hospital and general practice is given in various departments of the hospitals at Inverness and with selected general practitioners in the town and surrounding district. The post, which will become vacant in the month of January, 1954, is non-resident, and the salary is £670 p.a.

Candidates should apply by 15th January, 1954, on forms obtainable from the undersigned, by whom further particulars will be supplied on request.

A. M. FRASER, M.D.,
Secretary and Administrative Medical Officer.
Office of the Northern Regional Hospital Board,
Raigmore, Inverness.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. Applications are invited for the following posts :—

(*a*) RESIDENT or NON-RESIDENT MEDICAL REGISTRAR or SENIOR HOUSE OFFICER at the Royal Infirmary. Post vacant 1st February, 1954. The successful applicant will work in the first instance in the wards of the Professor of Therapeutics. Closing date for applications 16th January, 1954.

(*b*) NON-RESIDENT REGISTRAR in E.N.T. Surgery at the Royal Infirmary Unit. Applications immediately.

Applications, stating age, qualifications and experience, with the names of 3 referees, should be sent to the Chief Administrative Officer, The United Sheffield Hospitals, West-street, Sheffield, 1.

SHEFFIELD. CITY GENERAL HOSPITAL. (642 Beds.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT CASUALTY REGISTRAR required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 18th January, 1954, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time Locum REGISTRAR (anæsthetics) required immediately at Scunthorpe and District War Memorial Hospital. Remuneration at rate of £16 per week, with a deduction if resident.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, naming 2 referees.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time Resident Locum CASUALTY REGISTRAR required immediately at the General Hospital, Nottingham. Remuneration at the rate of £16 per week, with a deduction for residence.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, naming 2 referees.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time Locum SURGICAL REGISTRAR required immediately at the Victoria Hospital, Worksop, for 1 month in first instance. Remuneration at rate of £16 per week, with a deduction for residence.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, naming 2 referees.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time Resident Locum SURGICAL REGISTRAR required at the Rotherham Hospital, Doncaster Gate, Rotherham, from 13th January, 1954, for 1 month in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, naming 2 referees.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time Locum REGISTRAR (anæsthetics) required immediately for 2 months at the Montagu Hospital, Mexborough, Rotherham. Remuneration at the rate of £16 per week with a deduction for residence.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, naming 2 referees.

SKIPTON (near). THE HOSPITAL, Grassington, near SKIPTON. (208 Beds.) MIDDLETON AND GRASSINGTON GROUP. Applications are invited for the appointment of JUNIOR HOSPITAL MEDICAL OFFICER at the above Hospital for tuberculosis. The Hospital caters for pulmonary tuberculosis and thoracic surgery. Remuneration £700 rising to £1000 p.a., in accordance with National award. Accommodation available for single applicants for which an appropriate deduction for full board-residence will be made.

Applications to the Secretary at the above Hospital.

SLOUGH. UPTON HOSPITAL. Anæsthetic Registrar (resident) required at above Hospital. Post recognised for D.A. Approximately 60% of duties performed at Upton Hospital and 40% shared between other hospitals in the Group. Hospital may be visited by direct appointment.

Application form obtainable from, and returnable to, Group Secretary, Windsor Group Hospital Management Committee, Alma-road, Windsor, by 23rd January, 1954.

SLOUGH. UPTON HOSPITAL. House Physician required for post vacant 4th February, 1954. National salary.

Applications, stating age, experience and qualifications, together with copies of recent testimonials, to Hospital Secretary.

SHREWSBURY. ROYAL SALOP INFIRMARY AND COPTHORNE HOSPITAL. (500 Beds.) SHREWSBURY GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT ANÆSTHETIST (Senior House Officer). Post recognised under conditions of F.F.A.R.C.S. examination. Vacant immediately.

Applications, stating age, nationality, qualifications and previous experience, together with copies of recent testimonials, should be sent to the Group Secretary, Hospital Management Committee, Royal Salop Infirmary, Shrewsbury.

J. P. MALLETT, Group Secretary.

SHREWSBURY. ROYAL SALOP INFIRMARY AND COPTHORNE HOSPITAL. (500 Beds.) SHREWSBURY GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of GYNÆCOLOGICAL HOUSE SURGEON (Male or Female). There are 50 gynæcological beds and 2 House Surgeons. The post is recognised for the M.R.C.O.G.

Applications, stating age, qualifications, nationality and experience, accompanied by copy testimonials, should be sent to the Secretary, Group 15 Hospital Management Committee, Royal Salop Infirmary, Shrewsbury.

J. P. MALLETT, Group Secretary.

Royal Salop Infirmary, Shrewsbury.

SOUTHEND-ON-SEA HOSPITAL. Applications are invited for the appointment of RESIDENT SENIOR HOUSE OFFICER (clinical pathology) for duties within the Units comprising the above Hospital. Post tenable for 1 year and recognised for the Diploma in Pathology. Previous experience in pathology not essential, but applicants must have good clinical experience. Salary £670 p.a., less appropriate deduction for board.

Applications, with copies of at least 2 recent testimonials, to be sent to the undersigned not later than 16th January, 1954.

J. C. FIELD, Secretary.

General Hospital, Rochford, Essex.

SOUTHAMPTON CHILDREN'S HOSPITAL. (Recog-nised by Conjoint Board for D.C.H.) HOUSE OFFICER required. Salary, &c. as nationally advocated. Preference given to candidates intending to specialise in paediatrics.

Applications, with copies of testimonials, to be submitted as soon as possible to the Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON EYE HOSPITAL. (32 Beds. Recog-nised for the D.O.M.S.) RESIDENT SENIOR HOUSE OFFICER required immediately. Salary £670 p.a.

Applications, with copies of testimonials, should be forwarded as soon as possible to the Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON GENERAL HOSPITAL. (471 Beds.) HOUSE PHYSICIAN (resident) required in February. Post tenable for 6 months ; pre-registration candidates ineligible.

Applications, with copies of testimonials, to be forwarded as soon as possible to the Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON GENERAL HOSPITAL. (471 Beds —80 surgical.) 2 HOUSE SURGEONS required mid-January and mid-February. Posts tenable for 6 months. Both recognised for F.R.C.S. and the latter for Pre-registration Service.

Applications, with copies of testimonials, should be forwarded as soon as possible to the Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL (278 Beds) and SOUTHAMPTON GENERAL HOSPITAL (471 Beds). SENIOR HOUSE OFFICER (E.N.T.) required towards end of January. Post recognised for the F.R.C.S. (Eng.) and D.L.O. examinations and provides experience in all branches of E.N.T. work, including audiometry. The Group includes a diagnostic and distributing Hearing Aid Centre.

Applications, with copies of recent testimonials, should be forwarded as soon as possible to the Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SWANSEA. MOUNT PLEASANT HOSPITAL. (276 Beds.) GLANTAWE HOSPITAL MANAGEMENT COMMITTEE. Registered medical practitioners are invited to apply for the resident appointment of JUNIOR HOSPITAL MEDICAL OFFICER for work in the Medical and Surgical Departments, and in the Chronic Sick Wards of the above Hospital.

Applications, stating age, experience, and qualifications, should be addressed to—

O. C. HOWELLS, Group Secretary,
Glantawe Hospital Management Committee.
St. Helen's-road Swansea.

SWANSEA HOSPITAL. (403 Beds.) Glantawe Hospital MANAGEMENT COMMITTEE. Registered medical practitioners are invited to apply for the resident appointment of SENIOR HOUSE OFFICER in the Orthopædic Department of Swansea Hospital. The Hospital is recognised for Part II of the Diploma in Physical Medicine.

Applications, stating age, qualifications and experience, should be addressed to— O. C. HOWELLS, Group Secretary,
Glantawe Hospital Management Committee.
St. Helen's-road, Swansea.

SWANSEA HOSPITAL. (403 Beds.) Glantawe Hospital MANAGEMENT COMMITTEE. Registered medical practitioners are invited to apply for the resident post of SENIOR HOUSE OFFICER in the E.N.T. Department of the above Hospital. The Hospital is recognised under the regulations of the F.R.C.S. (E.N.T.) and the D.L.O.

Applications, stating age, qualifications and experience, should be forwarded to O. C. HOWELLS, Group Secretary.
St. Helen's-road, Swansea.

SOUTHPORT AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE.

Southport General Infirmary

SENIOR HOUSE OFFICER (surgical and casualty), resident, required early January, 1954.

Southport Promenade Hospital

SENIOR HOUSE OFFICER (Surgeon), resident, required immediately. Duties include mainly orthopædic and E.N.T.

Apply with 2 testimonials, stating age, qualifications, nationality and experience to—

T. CROOK, Group Secretary,
Southport and District Hospital Management Committee.
Promenade Hospital, Southport.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REDHILL AND CROYDON GROUP HOSPITAL MANAGEMENT COMMITTEES. REGISTRAR in Chest Medicine. Assistant to Consultant Chest Physician in Redhill and Purley Chest Clinic areas, with combined population of 205,700 and combined register of 1000. The work includes clinic and hospital duties (49 Beds) and also preventive work under Local Authority Scheme. Applicants may visit Redhill Clinic by arrangement with Consultant.

Apply to Group Secretary, Redhill Group Hospital Management Committee, Redhill County Hospital, Earlswood Common, Redhill, Surrey.

ST. ALBANS CITY HOSPITAL, St. Albans, Herts. (382 Beds.) CASUALTY OFFICER (Registrar grade) required for the Casualty Department at the above Hospital. Post recognised for the F.R.C.S. regulations and vacant approximately 12th January, 1954, for 6 months or longer. This is a temporary appointment.

Applications, stating age, qualifications, and experience, together with the names of 2 referees, should be forwarded to the Group Secretary, St. Albans City Hospital, Normandy-road, St. Albans, immediately.

ST. HELENS AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. The following Resident House Officer posts become vacant on the dates shown :—

St. Helens Hospital

1 HOUSE SURGEON, immediate vacancy.
1 HOUSE PHYSICIAN, vacant 1st April, 1954.
1 HOUSE SURGEON, vacant 1st May, 1954.

Whiston Hospital

3 HOUSE PHYSICIANS.
2 HOUSE SURGEONS.

Above vacancies 1st April, 1954.

All the above posts are recognised for Pre-registration Service.

Applications, stating age, experience, and date of qualification and giving 2 names for reference, should be forwarded to the Secretary, Group Office, Whiston Hospital, Prescot, immediately.

STOKE-ON-TRENT. BUCKNALL ISOLATION HOSPITAL. STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications invited for the post of SENIOR HOUSE OFFICER (medical) vacant very shortly.

Applications, with copy testimonials, and full details to the Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. HOUSE OFFICER (orthopædics) required, vacant now. Post recognised for F.R.C.S.

Applications, stating age and nationality, together with details of previous service, to the Group Secretary, Stoke-on-Trent Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOCKPORT INFIRMARY, Stockport. Applications are invited for the following posts which are approved for pre-registration purposes :—

HOUSE OFFICER (general surgery and E.N.T.). Recognised for the F.R.C.S. and D.L.O.
HOUSE OFFICER (general surgery and ophthalmology). Recognised for the F.R.C.S. and D.O.M.S.
HOUSE OFFICER (general surgery and gynæcology). Recognised for the F.R.C.S.

Applications, stating age, experience and qualifications, together with copies of 2 testimonials, to be addressed to the Secretary, Stockport and Buxton Hospital Management Committee, 59B, Shaw-heath, Stockport, Cheshire.

STOCKPORT INFIRMARY, Stockport. (163 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (anæsthetics). This post is recognised for the D.A. and F.F.A. R.C.S.

Applications, stating age, experience and qualifications, together with copies of 2 testimonials, to be addressed to the Secretary, Stockport and Buxton Hospital Management Committee, 59B, Shaw-heath, Stockport, Cheshire, immediately.

STOCKPORT INFIRMARY, Stockport. (163 Beds.) Applications are invited for the post of HOUSE OFFICER or SENIOR HOUSE OFFICER (medicine).

Applications, stating age, experience and qualifications, together with copies of 2 testimonials, to be addressed to the Secretary, Stockport and Buxton Hospital Management Committee, 59B, Shaw-heath, Stockport, Cheshire, immediately.

SUTTON. BELMONT HOSPITAL. St. Ebba's and BELMONT GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for appointment as SENIOR REGISTRAR at above Hospital which is principally concerned with the treatment of neuroses and the early psychoses. There are ample opportunities for research and the Hospital takes an active part in teaching in association with teaching hospitals. Candidates should possess the D.P.M. and may visit the Hospital by appointment with the Physician-Superintendent.

Application forms may be obtained from the Group Secretary, Group Office, Belmont Hospital, Brighton-road, Sutton, Surrey, and completed forms (5 copies) should be returned to him within 2 weeks of the appearance of this advertisement.

STAFFORD. STAFFORDSHIRE GENERAL INFIRMARY. (175 Beds—Recovery Unit 32 Beds.) STAFFORD HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON (Male or Female), vacant 1st February. Post recognised for Pre-registration Service and for F.R.C.S.

Applications, giving full particulars, together with copies of 3 recent testimonials, to the Group Secretary, 13, Foregate-street, Stafford.

SULLY HOSPITAL, Sully, Penarth, Glam. Major Thoracic CENTRE. (324 Beds.) CARDIFF HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICERS, required commencing 1st February, 1954. Experience gained in treatment of all chest diseases.

Form of application immediately from Group Secretary, Cardiff Hospital Management Committee, 44, Cathedral-road, Cardiff.

SWINDON HOSPITALS. (500 Beds.) Applications invited for RESIDENT HOUSE PHYSICIAN in acute Medical Unit of 64 Beds at St. Margaret's Hospital. Post recognised for training under pre-registration Internship regulations.

Full details, together with copies of 3 recent testimonials, to Secretary, Swindon and District Hospital Management Committee, 7, Okus-road, Swindon, Wilts, as soon as possible.

TAUNTON HOSPITAL MANAGEMENT COMMITTEE. TAUNTON AND SOMERSET HOSPITAL (Musgrove Park and East Reach Branches). Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER (anæsthetics). The Hospital is recognised for training for the D.A. and it is hoped will shortly be recognised for the F.F.A. Previous experience in anæsthesia, while desirable, is not essential.

Applications, stating age, qualifications with dates, and details of experience together with the names of 2 referees, should be sent immediately to the Secretary, Musgrove Park Hospital, Taunton, Somerset.

TEES-SIDE HOSPITAL MANAGEMENT COMMITTEE. GROUP LABORATORY SERVICE. Applications are invited for the post of RESIDENT PATHOLOGIST (Senior House Officer grade) required for duties in the Central Area Laboratory and other laboratories, and laboratories and Hospitals in the Group. The post offers a very wide scope and is suitable for those persons training for other specialties or contemplating a career in pathology.

Applications, stating age, qualifications and experience, together with the names of 2 referees (or enclosing copy testimonials) should be sent immediately to the Group Pathologist, Central Clinical Laboratory, General Hospital, Ayresome Green-lane, Middlesbrough.

TORQUAY. TORBAY HOSPITAL. Torquay District HOSPITAL MANAGEMENT COMMITTEE. RESIDENT SENIOR HOUSE OFFICER (medical) required by 24th January, 1954.

Applications, with qualifications, nationality, age, copies of testimonials (quoting Ref. F. 955/38), to Group Secretary, Torquay District Hospital Management Committee, East-street, Newton Abbot, S. Devon.

TORQUAY. TORBAY HOSPITAL. Torquay District HOSPITAL MANAGEMENT COMMITTEE. RESIDENT SENIOR HOUSE OFFICER (surgical) required for 1st February, 1954. (Post recognised for F.R.C.S.)

Applications, with qualifications, nationality, age, copies of testimonials (quoting Ref. F. 955/39), to Group Secretary, Torquay District Hospital Management Committee, East-street, Newton Abbot, S. Devon.

TUNSTALL. BURSLEM, HAYWOOD AND TUNSTALL WAR MEMORIAL HOSPITAL. (96 Beds.) STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for HOUSE OFFICER (medical).

Apply, with copy testimonials and details of previous appointments held, to the Group Secretary, Stoke-on-Trent Hospital Management Committee, Princes-road, Stoke-on-Trent, as soon as possible.

TUNSTALL. BURSLEM, HAYWOOD AND TUNSTALL WAR MEMORIAL HOSPITAL. (96 Beds.) STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for SENIOR HOUSE OFFICER (surgical).

Apply, with copy testimonials and details of previous appointments held, to the Group Secretary, Stoke-on-Trent Hospital Management Committee, Princes-road, as soon as possible.

TYNEMOUTH VICTORIA JUBILEE INFIRMARY, Hawkey's-lane, NORTH SHIELDS, NORTHUMBERLAND. (109 Beds.) Applications are invited for the following posts available in January :—

SENIOR HOUSE SURGEON.
HOUSE SURGEONS (2).

1 House Surgeon post is recognised for Pre-registration Service, and both are recognised, subject to certain conditions, for F.R.C.S. purposes.

Applications, with 2 testimonials, or names of 2 referees, should be sent to the House Governor.

VENTNOR, ISLE OF WIGHT. ROYAL NATIONAL HOSPITAL FOR DISEASES OF THE CHEST. (249 Beds.) JUNIOR HOSPITAL MEDICAL OFFICER (resident), unmarried. Hospital has all facilities for major thoracic surgery.

Applications, with names of 2 referees, to Physician-Superintendent.

WARRINGTON GENERAL HOSPITAL. (368 Beds.) Applications are invited for the post of HOUSE SURGEON (Male or Female ; recognised for pre-registration) at the above Hospital. National Health Service terms and conditions. The staffing of the Surgical Unit consists of a Senior Registrar, Registrar and 2 House Surgeons. The post offers a comprehensive training in surgery.

Apply, giving full particulars, to—

H. L. BOOT, Group Secretary,
Warrington and District Hospital Management Committee.
c/o General Hospital, Warrington, Lancs.

WARRINGTON INFIRMARY. (172 Beds.) Applications are invited for a vacancy at the above Hospital for a RESIDENT HOUSE SURGEON (Male or Female). Salary will be £350–£450 p.a., less a deduction of £100 for full residential emoluments.

Applications should be sent to—

H. L. BOOT, Group Secretary,
Warrington and District Hospital Management Committee,
c/o General Hospital, Warrington, Lancs.

WARWICK (near). KING EDWARD VII MEMORIAL SANATORIUM, HERTFORD HILL, near WARWICK. (Diseases of the Chest—225 Beds.) SOUTH WARWICKSHIRE HOSPITAL GROUP (NO. 14). Applications are invited for the post of SENIOR HOUSE OFFICER at the above Sanatorium, which is a modern building, to take up duties immediately. All forms of therapy and minor surgery are carried out and the Sanatorium works in close association with a major Thoracic Surgery Unit in a nearby hospital which will be transferred to the Sanatorium in 1954.

Applications, together with the names of 3 referees, should be forwarded to the Medical Superintendent as soon as possible.

WARWICK HOSPITAL. Applications are invited for the resident post of HOUSE OFFICER in Orthopædics. Work includes attendance at clinics.

Applications, with copies of 2 recent testimonials, to the Administrative Officer, Warwick Hospital, Warwick.

WARWICKSHIRE. SOUTH WARWICKSHIRE HOS-PITAL GROUP (NO. 14). WARWICK HOSPITAL. SENIOR HOUSE OFFICER (anæsthetics). Applications are invited for this appointment for duties mainly at the above Hospital. The post is vacant, recognised for D.A. and application sent for recognition for F.F.A.

Applications, giving the names and addresses of 3 referees, should be sent to the Group Secretary, 87, Radford-road, Leamington Spa, as soon as possible.

WAKEFIELD. PINDERFIELDS GENERAL HOSPITAL. Applications invited for the following appointments in the Leeds Regional Thoracic Centre at Pinderfields General Hospital :—

SENIOR HOUSE PHYSICIAN.
SENIOR HOUSE SURGEON.

Salary £670 p.a., from which a deduction at the rate of £130 p.a. will be made for board, lodging, &c.

Address written applications to undersigned, giving full details of experience, and 2 names and addresses for reference.

W. E. EASTWOOD, Deputy Group Secretary.
Victoria Chambers, Wood-street, Wakefield.

WATFORD AND DISTRICT PEACE MEMORIAL HOS-PITAL, WATFORD, HERTS. (197 Beds.) HOUSE PHYSICIAN required as from beginning of February at the above modern Hospital situated on the main London Bakerloo Line. This is a pre-registration post and preference will be given to candidates desiring such experience. National Health Service salary scale and conditions of service.

Applications, enclosing 2 copies of recent testimonials, should be sent to CYRIL HOPKINSON, Administrator.

WATFORD. SHRODELLS HOSPITAL. (General Hos-pital—420 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER to the Geriatric Unit. This is a newly formed unit for the study of geriatric conditions under a full-time Specialist. If resident, there will be a deduction of £140 p.a. for emoluments. Adequate time is available for reading.

Applications, together with not more than 2 copies of recent testimonials, should reach the Medical Officer-in-charge as soon as possible.

WELSH REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of a SENIOR REGISTRAR in Thoracic Surgery at Sully Hospital, near Cardiff (324 Beds), which is the Thoracic Centre for pulmonary tuberculosis and other chest diseases for South Wales. The post is non-resident and will be subject to review annually.

Forms of application should be obtained from the Senior Administrative Medical Officer, Welsh Regional Hospital Board, Cathays Park, Cardiff, within 14 days of appearance of this advertisement.

WELSH REGIONAL HOSPITAL BOARD. Sully Hospital, SULLY, near PENARTH. (324 Beds.) Applications are invited for the appointment of a REGISTRAR in Thoracic Medicine in this Regional Thoracic Centre, from 1st February, 1954. Experience in respiratory and cardiac function tests desirable. The post may be either resident or non-resident and will be subject to review at the end of the first year.

Forms of application should be obtained from the Senior Administrative Medical Officer, Welsh Regional Hospital Board, Cathays Park, Cardiff, within 14 days of appearance of this advertisement.

WELSH REGIONAL HOSPITAL BOARD. Required immediately, Locum Tenens SENIOR REGISTRAR in Obstetrics and Gynæcology for a period of 3 months, pending a permanent appointment being made. The successful applicant will be based on the St. David's Hospital, Bangor, and will be expected to work in other hospitals in the Caernarvon and Anglesey Group. Salary in accordance with the terms and conditions of service.

Applications to be addressed to the Senior Administrative Medical Officer, Welsh Regional Hospital Board, Cathays Park, Cardiff, with the names of 2 referees.

WELSH REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of a SENIOR REGISTRAR in Obstetrics and Gynæcology to serve the Caernarvon and Anglesey Hospital Management Committee. The successful candidate will be based at St. David's Hospital, Bangor, and may also be expected to serve other hospitals within the Group. The post is non-resident and will be subject to review annually.

Forms of application should be obtained from the Senior Administrative Medical Officer, Welsh Regional Hospital Board, Cathays Park, Cardiff, within 14 days of appearance of this advertisement.

WELSH REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of a REGISTRAR in Traumatic Surgery to serve the Cardiff Hospital Management Committee. The successful candidate will be based at St. David's Hospital, Cardiff, and may also be expected to serve in other hospitals in the Group. The post is resident and subject to review at the end of the first year.

Forms of application should be obtained from the Senior Administrative Medical Officer, Welsh Regional Hospital Board, Cathays Park, Cardiff, within 14 days of appearance of this advertisement.

WELSH REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of a REGISTRAR in General Medicine to serve the Merthyr and Aberdare Hospital Management Committee. The successful candidate will be based at Merthyr General Hospital, Merthyr (120 Beds), and will also serve other hospitals within the Group. The post may be either resident or non-resident and will be subject to review at the end of the first year.

Forms of application should be obtained from the Senior Administrative Medical Officer, Welsh Regional Hospital Board, Cathays Park, Cardiff, within 14 days of appearance of this advertisement.

WELSH REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of a REGISTRAR in General Surgery to serve the Merthyr and Aberdare Hospital Management Committee. The successful candidate will be based at Merthyr General Hospital, Merthyr, and will also serve other hospitals within the Group. The post may be either resident or non-resident and will be subject to review at the end of the first year.

Forms of application should be obtained from the Senior Administrative Medical Officer, Welsh Regional Hospital Board, Cathays Park, Cardiff, within 14 days of appearance of this advertisement

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOS-PITAL. (311 Beds.) HOUSE OFFICER (anæsthetics), vacant 4th February. The Hospital is recognised for the F.F.A. R.C.S. and D.A.

Applications, with copies of 2 testimonials, should be sent to the Secretary.

WIGAN AND LEIGH HOSPITAL MANAGEMENT COMMITTEE. HOUSE PHYSICIAN (Senior House Officer grade) required to undertake duty in the General Medical and Pædiatric Departments at Wigan Infirmary. The successful applicant will work under a Consultant Physician and a Consultant Pædiatrician.

Applications, stating age, nationality, qualifications, and experience, accompanied by the names and addresses of 2 referees, should reach the undersigned as soon as possible.

Knowsley House, Wigan. T. W. HURST, Secretary.

WELLS, SOMERSET. MENDIP HOSPITAL. Applica-tions are invited for the appointment of RESIDENT JUNIOR HOSPITAL MEDICAL OFFICER (married or single), for duty at the above Mental Hospital. Salary will be on the scale of £700–£50–£1000 p.a., with a charge of £150 per year for residential services, or, in the case of a married man, a charge for a flat. The appointment will be in accordance with the terms and conditions of service issued by the Ministry of Health.

Applications, stating age, qualifications and experience, together with the names and addresses of 2 referees, should be forwarded to the Physician-Superintendent, Mendip Hospital, Wells, Somerset, not later than 10 days after the publication of this advertisement.

WEST BROMWICH AND DISTRICT GENERAL HOS-PITAL, Edward-street, WEST BROMWICH. (144 Beds.) WEST BROMWICH AND DISTRICT HOSPITALS MANAGEMENT COMMITTEE GROUP NO. 18. Applications are invited for the post of HOUSE PHYSICIAN which will be vacant on 1st April, 1954. Salary, terms and conditions in accordance with the Ministry of Health regulations. The post is tenable for 6 months, resident, and is recognised for pre-registration scheme.

Applications, together with 3 recent testimonials, should be submitted to J. O. ROBINS, Esq., Group Secretary.

WESTON-SUPER-MARE GENERAL HOSPITAL. (110 Beds.) Applications are invited from registered medical practitioners for the resident appointment of HOUSE PHYSICIAN (first, second, or third post), now vacant. The appointment is for 6 months in the first instance and may be renewed for a further 6 months.

Applications, stating age, qualifications, and experience, together with names and addresses of 2 referees, should be addressed to the Secretary, Weston-super-Mare Hospital Management Committee.

WESTON-SUPER-MARE GENERAL HOSPITAL. (110 Beds.) Applications are invited from registered medical practitioners for the resident appointment of HOUSE SURGEON (first, second, or third post). The appointment will be for a period of 6 months in the first instance and may be renewed for a further 6 months.

Applications, stating age, qualifications and experience, together with names and addresses of 2 referees, should be addressed to the Secretary, Weston-super-Mare Hospital Management Committee.

WHITEHAVEN HOSPITAL, Cumberland. (109 Beds and Annexe of 19 Beds.) HOUSE SURGEON for Orthopædic and Casualty Departments (House Officer or Senior House Officer grade), vacant now.

Detailed applications, with dates and copies of 2 testimonials, to Secretary.

WORCESTER ROYAL INFIRMARY. House Surgeon (orthopædics) required immediately. The appointment is for 6 months and is subject to the terms and conditions of service for hospital medical staff.

Applications, with copies of testimonials, should be sent to the Secretary.

WINDSOR. KING EDWARD VII HOSPITAL. Applications are invited from General Practitioners for the post of Honorary CLINICAL ASSISTANT (1 session per week, Friday morning) in General Medicine, which became vacant on 1st January, 1954. Candidates are required to be Members of a Medical Protection Society.

Applications to Group Secretary, Windsor Group Hospital Management Committee, Alma-road, Windsor, not later than 23rd January, 1954.

WOLVERHAMPTON HOSPITAL MANAGEMENT COMMITTEE GROUP NO. 16 BIRMINGHAM REGION.

The Royal Hospital, Wolverhampton (an Associated Hospital of the University of Birmingham Medical School)

HOUSE OFFICER (Ear, Throat and Nose Department), vacant now.

HOUSE OFFICERS (general surgery), 1 vacant now, 1 vacant 31st January.

New Cross Hospital, Wolverhampton

HOUSE OFFICER (general surgery), vacant 20th January.

Applications, with copies of 3 recent testimonials, to be sent to W. COCKBURN, Group Secretary.

The Royal Hospital, Wolverhampton.

WREXHAM. MAELOR GENERAL HOSPITAL. (513 Beds.) WREXHAM, POWYS AND MAWDDACH HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of HOUSE PHYSICIAN at the above Hospital. The appointment is recognised for Pre-registration Service and will fall vacant at the end of January, 1954. Salary will be at the rate of £350–£450 p.a., according to experience, less £100 p.a. for full residential accommodation.

Applications, stating age, nationality, qualifications and experience, with copies of 2 recent testimonials, to be addressed to the Secretary Wrexham, Powys and Mawddach Hospital Management Committee, Maelor General Hospital, Croesnewydd-road, Wrexham.

WREXHAM. WAR MEMORIAL HOSPITAL. (170 Beds.) WREXHAM, POWYS AND MAWDDACH HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of HOUSE PHYSICIAN at the above Hospital. The appointment is recognised for Pre-registration Service and will fall vacant at the end of January, 1954. Salary will be at the rate of £350–£450 p.a., according to experience, less £100 p.a. for full residential accommodation.

Applications, stating age, nationality, qualifications and experience, with copies of 2 recent testimonials, to be addressed to the Secretary, Wrexham, Powys and Mawddach Hospital Management Committee, Maelor General Hospital, Croesnewydd-road, Wrexham.

WREXHAM (near). TREVALYN MANOR MATERNITY HOSPITAL, ROSSETT. (45 Beds.) WREXHAM, POWYS AND MAWDDACH HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners, preferably Female, for the post of OBSTETRIC HOUSE SURGEON at the above Hospital, to commence 1st February, 1954. Salary will be at the rate of £350–£450 p.a., according to experience, less £100 for full residential emoluments. The appointment will, in the first instance, be for 6 months. Successful applicant will assist and deputise for the Medical Officer.

Applications, giving age, nationality, qualifications and experience, accompanied by copies of 2 recent testimonials, should be forwarded to—

WILLIAM JONES, Group Secretary, Wrexham,
Powys and Mawddach Hospital Management Committee.
Maelor General Hospital, Croesnewydd-road, Wrexham.

YORKSHIRE. EAST RIDING HOSPITAL MANAGE- MENT COMMITTEE.

Westwood Hospital, Beverley, Yorks (218 Beds)

(*a*) ORTHOPÆDIC HOUSE SURGEON (Senior House Officer), vacant now. Recognised for F.R.C.S.

(*b*) HOUSE SURGEON (first, second, or third post), vacant end January. Pre-registration post. Recognised for F.R.C.S. General surgical duties, some orthopædic.

Broadgate (Mental) Hospital, Beverley, Yorks (650 Beds)

(*c*) HOUSE PHYSICIAN (first, second, or third post), vacant mid-January.

Salary for (*a*) is £670 p.a., less £140 board, lodging; £350–£450, less £100 board, lodging for (*b*) and (*c*). Fully qualified practitioners also invited to apply for pre-registration post.

Detailed applications to Secretary, Westwood Hospital, Beverley, Yorks.

WORTHING GROUP HOSPITAL MANAGEMENT COM- MITTEE.

Worthing Hospital, Lyndhurst-road, Worthing, Sussex

Applications are invited from registered medical practitioners for the appointment of SURGICAL HOUSE OFFICER (Senior House Officer grade). The post is recognised for the revised Fellowship regulations in respect of the 6 months training required by candidates for the Final Fellowship examination.

Applications, stating age, qualifications, nationality and experience, together with copies of 2 recent testimonials, to be forwarded to the Hospital Secretary as soon as possible.

Worthing Hospital (221 Beds—General)

1 HOUSE SURGEON vacancy.

Applications from either registered medical practitioners, or pre-registration candidates, stating age, qualifications, experience, nationality, and enclosing copies of 2 recent testimonials, to be forwarded to the Hospital Secretary as soon as possible.

A. V. OAKTON, Group Secretary.

WORTHING HOSPITAL, Lyndhurst-road, Worthing, SUSSEX. WORTHING GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of CASUALTY OFFICER (Senior House Officer grade), vacant February, 1954. The post is recognised for the F.R.C.S.

Applications, giving full particulars, together with copies of 2 recent testimonials, to be forwarded to the Hospital Secretary.

A. V. OAKTON, Group Secretary.

WORTHING HOSPITAL, Lyndhurst-road, Worthing, SUSSEX. WORTHING GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT SURGICAL OFFICER (Registrar grade) at the above Hospital, vacant 1st February, 1954. The post is recognised under the revised Fellowships regulations for the F.R.C.S. examination, but preference will be given to candidates holding the F.R.C.S. qualification.

Forms of application are available from the undersigned.

A. V. OAKTON, Group Secretary.

WOODFORD GREEN, ESSEX. HARTS HOSPITAL. (100 Beds.) HOUSE OFFICER required. Post vacant immediately. The Hospital is a modern sanatorium with Thoracic Surgery Unit and Area Chest Clinic. Post offers exceptional opportunity for gaining experience in tuberculosis and diseases of the chest. The Hospital is close to the underground railway and within easy reach of Central London.

Applications, with copy of a recent testimonial, should be sent immediately to the Secretary, Forest Group Hospital Management Committee, Langthorne-road, E.11.

WINNIPEG MUNICIPAL HOSPITALS, Winnipeg, CANADA. SENIOR INTERNE required to fill position at the above Hospitals. Remuneration at the rate of $200 per month plus full maintenance. Arrangements can be made to advance a loan covering passage money from the U.K. to Winnipeg.

Further details may be obtained by writing to the Medical Director, Winnipeg Municipal Hospitals, Morley-avenue, Winnipeg, Canada.

NEW YORK. NEW ROCHELLE HOSPITAL, New ROCHELLE, NEW YORK, U.S.A. (360-Bed general community hospital.) Approved by American College of Surgeons and American Medical Association for Interneship and Residency Training. Only graduates from approved university schools accepted. Term of Interneship: 1st July, 1954–30th June, 1955. INTERNES—$100 per month plus full maintenance. Return passage to England paid by Hospital after completion of interneship.

Apply Superintendent.

NEW YORK. ALBANY HOSPITAL, Albany, New York, U.S.A. INTERNSHIPS and RESIDENCIES available in 700-Bed general, private Albany Hospital, directly connected with Albany Medical College. Approved for all major specialties. Participating in Exchange-Visitor Program. Salary range $1320–$2220 annually in addition to laundry, uniforms and room. All appointments begin 1st July, 1954.

For further information apply to Medical Director.

U.S.A. SEATTLE GENERAL HOSPITAL, Seattle, WASHINGTON, U.S.A. HOUSE SURGEON required for Rotating Internship at 110-Bed hospital. On completion of Internship a graduate from English school recognised by A.M.A. would be admitted to licensing examination in the United States. Remuneration: board, lodging, and $150 per month.

Apply to Mr. E. A. HILL, Business Manager.

Public Appointments

BOARD OF CONTROL. Registrar at Broadmoor Institution, Crowthorne, Berks (900 Beds), for persons of unsound mind of criminal tendencies. Applicants must be registered medical practitioners. Appointment on National Health Service conditions of service and superannuation regulations. Furnished quarters available at appropriate charge.

Applications, stating name, date and place of birth, nationality, details of education, professional qualifications, war service, present and previous appointments, and names of 3 referees, to Medical Superintendent, Broadmoor Institution, Crowthorne, Berks, by 23rd January, 1954. Envelope to be marked A/R. Canvassing in any form leads to disqualification. Candidates may visit Institution by appointment with Medical Superintendent.

BOARD OF CONTROL. Whole-time Deputy Medical SUPERINTENDENT (Consultant) at Rampton Hospital, near Retford, Notts (1143 Beds), for patients exhibiting conduct disorders with mental deficiency. Excellent opportunities for study, treatment and training of behaviour disorders of all kinds and degrees. Applicants must be registered medical practitioners, with experience in psychiatry and the D.P.M.; post is clinical, but experience in hospital administration an advantage; duties may involve attendance at outpatient clinics. Appointment on National Health Service conditions of service and superannuation regulations. House on the estate available at appropriate rental.

Applications, stating name, date and place of birth, nationality, details of education, professional qualifications, war service, present and previous appointments, and names of 3 referees, to Medical Superintendent, Rampton Hospital, Retford, Notts, by 29th January, 1954. Envelopes to be marked A/DMS. Canvassing in any form leads to disqualification. Candidates may visit hospital by appointment with Medical Superintendent.

SCOTTISH GAS BOARD. Applications are invited from suitably qualified persons for the position of Whole-time MEDICAL OFFICER to the Board. A brief outline of the duties and scope of the post may be obtained on application to the undersigned. Applicants should possess a higher professional qualification, and should preferably have experience of industrial medical services. The salary will be according to qualifications and experience, and will be within the range £1200–£1800 p.a. The successful candidate will be required to pass a medical examination and to join the Board's contributory superannuation scheme.

Applications, giving full details of age, education, qualifications and experience, together with the names of 2 referees, should be addressed to the undersigned to be received not later than 15th February, 1954.

A. T. HERD, Secretary.

26, Drumsheugh-gardens, Edinburgh, 3.

CORPORATION OF LONDON. Applications are invited for the office of MEDICAL OFFICER OF HEALTH of the Port of London. The salary of the office is £2500 p.a., rising, in the discretion of the Common Council, to £2750 p.a. at the expiration of 2 years from the date of appointment, plus fees as Medical Inspector of Aliens (at present £100 p.a.). The present Medical Officer is due to retire on 31st March, 1954, and it is desired that the new appointment should take effect as soon thereafter as possible. The appointment will be amalgamated with that of the Medical Officer of Health for the City of London upon the retirement of the present holder of the latter office in approximately 3 years time. The Medical Officer of Health for the Port will then be required, subject to satisfactory service, to hold the amalgamated appointment, the salary of which will be £3000 p.a., plus fees as Medical Inspector of Aliens.

Full particulars of both offices and forms of application may be obtained from the Town Clerk, 55/61, Moorgate, London, E.C.2. Applications on the prescribed form must reach the Town Clerk's Office not later than NOON on Saturday, 30th January, 1954.

DERBYSHIRE COUNTY COUNCIL. Appointment of ASSISTANT COUNTY MEDICAL OFFICER OF HEALTH for the Derbyshire County Council and MEDICAL OFFICER OF HEALTH for the Borough of Ilkeston and the Urban Districts of Alfreton and Ripley. Applications are invited from Male or Female registered medical practitioners holding a Diploma in Public Health or an equivalent qualification for the above-named permanent "mixed" appointment. The total inclusive salary scale will be £1521 11s. 10d. p.a. rising by 4 annual increments of £55 13s. 7d., 1 of £55 13s. 9d., and 2 of £28 8s. 2d. to a maximum of £1856 16s. 3d. p.a., plus a car allowance. The person appointed will be directly responsible to the Councils of the Borough of Ilkeston and the Urban Districts of Alfreton and Ripley for the proper performance of all the duties of a Medical Officer of Health for those areas respectively. Under section 111 of the Local Government Act, 1933, Area No. 8 of the approved Scheme provides for a whole-time appointment to cover these Districts, as well as Heanor Urban District. The Officer appointed will be required to undertake the duties of Medical Officer of Health of Heanor Urban District when the present holder of that post retires, when the salary will be reviewed. As Assistant County Medical Officer he will be concerned, under the direction of the County Medical Officer of Health with decentralised supervision required under the National Health Service Act, as well as work in connection with the School Health Service, attendance at Clinics, and such other duties as may be required.

The person appointed must reside in 1 of the Sanitary Districts in Area No. 8. Sympathetic consideration will be given to the provision of housing accommodation if required. The Officer must not engage in private practice, and must devote the whole time to the duties of the before-mentioned posts. The appointment is subject to the provisions of the Local Government Superannuation Acts, 1937 and 1953, or the National Health Service (Superannuation) Regulations, 1950, whichever is appropriate, and the successful candidate will be required to pass a medical examination. Canvassing, either directly or indirectly, will be a disqualification.

Application forms may be obtained from the undersigned, to whom they should be returned so that they are received not later than 30th January, 1954.

J. B. S. MORGAN, County Medical Officer of Health.

County Offices, St. Mary's-gate, Derby.

FLINTSHIRE COUNTY COUNCIL. The Council invite applications for the appointment of COUNTY MEDICAL OFFICER OF HEALTH from registered medical practitioners possessing the appropriate qualifications. Candidates must possess substantial administrative experience and a wide knowledge and experience of the Public Health Services and the School Health Service. Salary £2000 rising by 5 annual increments of £50 to £2250 p.a., plus car allowance.

Form of application and further particulars may be obtained from the undersigned, to whom applications should be returned not later than 29th January, 1954.

W. HUGH JONES, Clerk of the County Council.

County Buildings, Mold.

HER MAJESTY'S COLONIAL SERVICE. Nairobi. Applications are invited for appointment as HOUSEMEN at the King George VI Hospital, Nairobi. Appointment will be on agreement for 1 year in the capacity of a House Physician or House Surgeon. These posts are interchangeable by mutual agreement after 6 months experience in either. Officers should be under the age of 30 and single. Candidates who have not yet completed their pre-registration training should confirm from their Licensing Bodies that these posts are acceptable to them for the purposes of the Medical Act, 1950. Salary £300 a year for the first 6 months and £350 a year for the second 6 months. In addition, a cost-of-living allowance of 35% of salary and a messing allowance of £144 a year is payable. Income-tax at local rates. Furnished quarters, including linen, cutlery and glassware together with light, fuel and water are provided free of charge. Free passages are provided on appointment and on satisfactory completion of Internship. 18 days local leave a year is granted. If the selected candidate applied for and obtains appointment to the Colonial Medical Service in Kenya at the expiration of his Internship, previous service as Resident Medical Officer will count for leave but he will be required to serve the usual probationary period. The period of Internship will not count for seniority. Ample opportunities for clinical experience with systematic teaching and a large measure of personal responsibility under Specialist guidance are afforded. Applications from doctors whose names appear on the Medical Register will only be considered from those who are not liable for National Service during the period of the engagement.

Candidates should apply for forms of application to the Director of Recruitment (Colonial Service), Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1 (quoting reference No. CDE.117/7/03).

HER MAJESTY'S COLONIAL SERVICE. British GUIANA. Applications are invited for appointment as VENEREAL DISEASES OFFICER AND DERMATOLOGIST in the Medical Department British Guiana. He would be responsible to the Director of Medical Services for the Social Diseases section of the Public Hospital, Georgetown, and would undertake such other work as the Director of Medical Services may prescribe. Candidates must possess a Diploma in Public Health and have had special experience in venereal diseases and dermatology. Appointment will be on a permanent basis with pension (non-contributory) at the age of 55, or on agreement for 3 years in the first instance. The emoluments range from £1300 to £1500 a year, made up of salary $4800–$5760 (£1000–£1200) p.a., a specialist allowance of $1200 (£250) p.a., and a cost-of-living allowance (non-pensionable) of $20 (£4 3s. 4d.) per mensem. Consultation practice is permitted and 50% of the fees are payable to the Officer. Pension is earned at the rate of 1/600th of the final pensionable emoluments for each completed month of service. Candidates in the National Health Service may resign from the National Health Service but retain their superannuation rights during their time in British Guiana (up to 6 years) and receive a resettlement grant of 20% of the aggregate of their Colonial salary on leaving British Guiana at the end of their engagements. Income-tax at local rates. Free passages on appointment are provided for Officer and family not exceeding 5 persons in all. On leave, free passages are provided for Officer and wife only. Local leave permissible and generous home leave granted after each tour of from 2 to 3 years. Climate is, generally speaking, healthy for Europeans. Educational facilities are available.

Application forms from the Director of Recruitment (Colonial Service), Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1 (quoting reference No. CDE.117/30/03)

HER MAJESTY'S COLONIAL SERVICE. Nigeria. PATHOLOGISTS required in Nigeria for routine clinical pathology and the supervision and training of African technical staff. The Officers may be required to assist in the production of yellow fever vaccine. Appointments may be made as follows :—

(*a*) on 3 years probation for permanent and pensionable employment in the Colonial Medical Service, with retiring age of between 45 and 55. Pensions are at the rate of 1/600th of final pensionable emoluments for each completed month of reckonable service ;

(*b*) from the National Health Service. Candidates may resign from the National Health Service but retain their superannuation rights during their time in Nigeria (up to 6 years) and receive a resettlement grant of 20% of the aggregate of their Colonial salary on leaving Nigeria at the end of their engagement ; or

(*c*) on short-term contract (2–4 tours of 18 months duration) with inclusive salary of from £1087 p.a. rising to £2000 p.a. ; on completion of contract a gratuity is paid at the rate of £37 10s. for each completed period of 3 months service (including leave).

Officers appointed under (*a*) or (*c*) are required to contribute to a Widows' and Orphans' Pension Scheme. Salaries, including pensionable expatriation pay for officers appointed under (*a*) or (*b*) range from £950 to £1850 p.a. Starting salary in all cases depends on experience and war service. Quarters are provided at low rents. Free passages in both directions are provided for Officer and his wife. Payment of the cost incurred on 1 outward and 1 homeward passage for each of 2 children under age of 18, subject to a maximum of £75 in respect of the return journey for each child, is also granted. Income-tax at local rates. Local leave is permissible and generous home leave is granted after each tour of 18 months duration. Candidates must possess a medical qualification registrable in the United Kingdom and have had at least 1 years postgraduate hospital experience. Experience in pathology is essential.

Application forms can be obtained from the Director of Recruitment (Colonial Service), Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1 (quoting reference No. CDE.117/14/05).

WESTERN AUSTRALIA. State Public Service. GOVERNMENT MEDICAL LABORATORIES. HÆMATOLOGIST (medical), permanent. The medical laboratories of the Royal Perth Hospital, at present combined with the State Public Health Laboratories of Western Australia, are undergoing a considerable process of extension in all branches. New laboratories are being built and the space area of each section is being replanned. The Department of Hæmatology is to be developed by a newly appointed Hæmatologist, with a technical staff of 6 in a series of 6 rooms.

Salary : £2000 (gross) (Australian) p.a., subject to adjustment in multiples of £20 p.a. as the basic wage declared by the Court of Arbitration of Western Australia is varied from time to time.

Qualifications : Applicants should possess medical degrees and preferably a specialist's qualification and have had at least 5 years experience in the Hæmatology Department of a medical school or large hospital in addition to some general experience as a Clinical Pathologist.

Duties : The duties of the Hæmatologist will be to develop and direct the work of this department, to instruct technical staff, and to carry out investigational work in cooperation with the staff of the hospital and its clinical research unit.

Transport : A reasonable amount will be allowed for transport of appointee and dependent family to Western Australia provided appointee enters into a bond to serve the State for a period of at least 3 years.

Conditions of Service : Superannuation benefits, long-service leave (3 months after each 7 years continuous service), and other conditions applying to permanent officers under the Public Service Act.

Further information may be obtained on application to the Director of Medical Laboratories, Public Health Department, Western Australia, and applications stating age, marital state, qualifications and experience should be addressed by 27th February, 1954, to the Secretary, Public Service Commissioner's Office, 60, Barrack-street, Perth, Western Australia.

FACTORY DOCTORS. Factories Acts, 1937 and 1948. The following appointment as Appointed Factory Doctor is vacant. Apply to Chief Inspector of Factories, 8, St. James's-square, London, S.W.1.

District	*County*	*Latest date for receipt of applications*
LENHAM	KENT	23RD JANUARY, 1954

HER MAJESTY'S COLONIAL SERVICE. Uganda. MEDICAL OFFICER required for general medical duties and to assist with the training of subordinate African medical staff. Appointment can be made (subject to 2 years probation) on a permanent basis with pension (non-contributory) at the age of 45–55, or on short-term contract with gratuity. Candidates in the National Health Service may resign from the National Health Service but retain their superannuation rights during their time in Uganda (up to 6 years) and receive a resettlement grant of 20% of the aggregate of their Uganda salary on leaving Uganda at the end of their engagements. Salary scale ranges from £865 to £1590 p.a. A temporary (non-pensionable) cost-of-living allowance is payable at the rate of 35% of salary, subject to a maximum of £350 p.a. Starting-point in the scale is determined according to qualifications and experience. Pension is earned at the rate of 1/600th of the final pensionable emoluments for each completed month of service. The gratuity in respect of contract appointments is payable on satisfactory completion of contract service at the rate of £100–£150 p.a. Quarters are provided with heavy furniture, at a rental of 10% of salary (7½% of salary if unfurnished). Free passages in both directions are provided for Officer and wife, and up to cost of 1 adult fare for children. Income-tax at local rates. Local leave is permissible and generous home leave is granted after each tour of from 30 to 36 months duration. Educational facilities are available in East Africa. Consulting practice under certain circumstances is allowed outside Government Institutions. Candidates must possess qualifications registrable in the United Kingdom.

Application forms can be obtained from the Director of Recruitment (Colonial Service), Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1 (quoting reference No. CDE. 117/9/02).

HER MAJESTY'S EMBASSY, KABUL. Medical Officer required. Candidates must be Male preferably under 40 years of age with surgical and medical qualifications. Duties mainly clinical and will include treatment of staff and families of British Embassy and of other missions at Kabul. Duration 2 years approximately. Salary £615 p.a., plus foreign allowance (tax free), approximately £1105 (married), £670 (single).

Write, giving date of birth, education, full details of qualifications and experience of posts held (including dates) to E.F.495, Appointments Officer, Ministry of Labour and National Service, 1–6, Tavistock-square, W.C.1, by 22nd January, 1954. No original testimonials should be sent.

NORFOLK. COUNTY OF NORFOLK. The Norfolk County Council and the County District Councils concerned invite applications from registered medical practitioners holding the Diploma in Public Health for the whole-time appointment of ASSISTANT COUNTY MEDICAL OFFICER AND DISTRICT MEDICAL OFFICER OF HEALTH for the undermentioned area :—

Area No. 5.
Diss Urban District.
Wymondham Urban District.
Depwade Rural District.
Loddon Rural District.
Total population approximately 40,000.

Apportionment of duties :—
Assistant County Medical Officer—13/22nds.
District Medical Officer of Health—9/22nds.

Combined salary scale £1396–£1651. Travelling and subsistence expenses will be paid in accordance with the County Council's scales.

The person appointed will act as Assistant County Medical Officer under the direction of the County Medical Officer, and as District Medical Officer of Health he will be subject to the instructions of the District Councils concerned.

Application forms, together with further particulars of the appointment, can be obtained from the County Medical Officer, 29, Thorpe-road, Norwich, to whom completed forms should be returned not later than 20th January, 1954.

TASMANIA. PUBLIC SERVICE OF TASMANIA. PUBLIC HEALTH DEPARTMENT—DIVISION OF MENTAL HYGIENE. Applications are invited for the position of MEDICAL OFFICER at the Lachlan Park Mental Hospital of 750 Beds where modern treatment of all forms of mental illness is given by a highly trained staff. The Hospital estate lies on a main highway about 20 miles from the capital city, and within 5 minutes walk of the shopping centre of the town of New Norfolk. It is situated in a pleasant countryside of wooded hills and valleys in proximity to the Derwent River. Recreational facilities include cinema, golf, tennis, bowls, football, cricket, and fishing. Annual leave of 30 days is allowed, plus 2 afternoons per week and alternate weekends. After 10 years service 90 days long-service leave becomes due and accrues thereafter at the rate of 9 days per year. The commencing salary of £1629 p.a. will be increased by 2 subsequent annual increments of £52. Basically furnished quarters, with fuel, light, laundry, vegetables, and milk will be provided for a nominal charge of £52 p.a., and an unmarried appointee may obtain meals in the Senior Staff dining-room for a further charge of £42 p.a. Contribution to a Government subsidised superannuation fund will provide a pension of £15 10s. per week on retirement. The Government will grant substantial assistance towards the cost of removal of the appointee and his family to Tasmania.

Further particulars may be obtained from the Medical Superintendent, Lachlan Park Hospital, New Norfolk, Tasmania, Australia.

Agent-General for Tasmania.

NEW SOUTH WALES DEPARTMENT OF PUBLIC HEALTH. NEUROPATHOLOGIST. Salary £A1700–£A1900 p.a. Commencing rate according to qualifications and experience. Applicants must be registered medical practitioners and possess a Diploma in Pathology or have approved pathological experience and be prepared to devote special attention to the study of neuropathology—research and practice. Successful applicant will be responsible to the Director of Pathological Laboratories for the efficient conduct of the Laboratory at Broughton Hall Psychiatric Clinic and in coöperation with the Division of Mental Hygiene facilitate the performance of all pathological services for mental hospitals. Successful applicant will be eligible, subject to medical examination, to contribute to the State Superannuation Fund. First-class shipping fares to Sydney of appointee and his family will be paid.

Applications, 6 copies (together with 6 copies of testimonials and other supporting documents) should be lodged at the office of the Agent-General for New South Wales, 56/57, Strand, London, W.C.2, by 22nd February, 1954.

General Practice

For an Executive Council post (England and Wales) apply on form E C.16A obtainable from the council. Mark envelope "Vacancy."

EDMONTON. Applications invited for Vacancy. List at present approximately 1800. Residence and surgery may be available. Apply on E.C.16A before 16th January, 1954, to—
F. J. ASHFORD, Middlesex Executive Council.
Gloucester House, Gloucester-gate, London, N.W.1.

ENFIELD. Applications invited for Vacancy. List at present approximately 5400. Residence and surgery may be available. Apply on E.C.16A before 16th January, 1954, to—
F. J. ASHFORD, Middlesex Executive Council.
Gloucester House, Gloucester-gate, London, N.W.1.

TWICKENHAM. Applications invited for Vacancy. List at present approximately 2000. Residence and surgery may be available. Apply on E.C.16A before 16th January, 1954, to—
F. J. ASHFORD, Middlesex Executive Council.
Gloucester House, Gloucester-gate, London, N.W.1.

Appointment : Too Late for Classification

MANCHESTER, 9. BOOTH HALL CHILDREN'S HOS-PITAL. Applications are invited for the following posts :—

HOUSE SURGEON. Recognised pre-registration post. Post vacant now.

RESIDENT SENIOR HOUSE OFFICER (surgical). Post vacant now. Main duties will be in recently opened Burns Unit, but person appointed will take part in general surgical rota.

RESIDENT SENIOR HOUSE OFFICER (surgical). Post vacant March, 1954.

National scale and conditions.

Apply, stating age, nationality, and usual relevant particulars, to the Medical Superintendent as soon as possible, and enclose copies of 2 recent references.

Miscellaneous

To non-professional posts the Notification of Vacancies Order 1952 applies

EAST LANCASHIRE HOMES FOR DISABLED SAILORS AND SOLDIERS, BROUGHTON HOUSE, Park-lane, KERSAL, MANCHESTER. Applications are invited for the post of RESIDENT MEDICAL SUPERINTENDENT. Single man or widower preferred. Salary £650 p.a. and full residential emoluments. Position would suit retired Service Officer. The Homes are not included in the National Health Scheme. Applications should be received by 15th March, 1954.

Apply to E. MESSENGER, F.C.A., Secretary.
18, Booth-street, Manchester, 2.

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